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ENTRIES 761-1582

## AGRONOMY

C. V. PIPER, *Editor*  
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(See also in this issue Entries 896, 1070, 1078, 1087, 1091, 1092, 1093, 1166, 1283, 1345, 1378, 1379, 1380, 1381, 1398, 1399, 1412, 1413, 1415, 1416, 1417, 1418, 1419, 1421, 1422, 1424, 1425, 1426, 1427, 1476, 1484, 1485, 1496, 1512, 1515, 1519, 1520, 1521, 1522, 1523, 1524, 1527, 1528, 1529.)

761. ANONYMOUS. El cultivo del henequen en Yucatán, su posible introduccion en el estado de Michoacan. [Henequen in Yucatan and its possible introduction into Michoacan.] Michoacan Agric. [Mexico] 1<sup>1</sup>: 4-5; 1<sup>2</sup>: 4-5; 1<sup>3</sup>: 5-6. 1920.—Popular information.—*John A. Stevenson.*

762. ANONYMOUS. Cultivo de la papa. [Potato cultivation.] Michoacan Agric. [Mexico] 1<sup>4</sup>: 7; 1<sup>5</sup>: 5-6. 1920.—Popular information.—*John A. Stevenson.*

763. ANONYMOUS. El cultivo del tabaco en España. [Tobacco cultivation in Spain.] Informacion Agric. [Madrid] 10: 484-486. 1920.—An outline of a proposed plan for growing tobacco under government supervision, with guaranteed returns to growers.—*John A. Stevenson.*

764. ANONYMOUS. Flax growing. Jour. Dept. Agric. Ireland 20: 520-523. 1920.

765. ANONYMOUS. [Rev. of: GEHRS, J. H. Productive agriculture. xii + 444 p. The Macmillan Co.: New York, 1918.] Sci. Prog. [London] 15: 148. 1920.

766. BAILEY, E. M. Report on commercial feeding stuffs. 1919. Connecticut [New Haven] Agric. Exp. Sta. Bull. 221. 345-393. 1920.—The analyses of 204 samples of feeds are given as required by State law. These analyses are preceded by a general discussion of the determining factors in compounding rations and definitions of feeding stuffs, as revised to Jan., 1919, and adopted by the Association of Feed Control Officials of the United States.—*Henry Dorsey.*

767. BARBER, C. A. Sugar production in India. Louisiana Planter and Sugar Manufacturer 64: 286. 1920.—While the acreage in sugar cane in India is very large, the production of sugar is very low. This is largely due to climatic conditions which prevent the growing of varieties which have been found most satisfactory in other countries.—*C. W. Edgerton.*



768. BARBILLION, M. Possibilities of new fibres for pulp and paper making. Paper 26<sup>21</sup>: 11-12, 32. 1920.—This article discusses esparto, bamboo, papyrus, broom, nettle, and other plants which are grown in France or its colonies and possess paper-making possibilities.—H. N. Lee.

769. BECKER-DILLINGEN, J. Serologische Untersuchungen auf dem Gebiete von Pflanzenbau und Pflanzenzucht. [Serum investigations in the field of plant structure and plant breeding.] Landw. Jahrb. 53: 245-276. 1919.—The author uses the serum and antigene method to determine impurities in meal and in seeds. He describes in detail the methods of preparing the antigene and the serum and reviews the literature. He finds that it is possible to make a quantitative determination of the amounts of *Agrostemma githago* seed in meal, an admixture of 0.125 per cent giving a specific reaction. Other common weed seeds as well as mixtures of weed seeds were studied with similar conclusions. The source of red clover seed could be determined in this way by noting the specific reaction due to the presence of characteristic weed seeds. By this method the seeds of *Brassica napus* could be distinguished from those of *Brassica rapa*, and the author was even able to distinguish between 2 different varieties of barley by making a serum test with the ground seed. All methods are described in detail since much of the success of the operation is said to depend on the proportions of antigene and serum.—A. J. Pieters.

770. BERRY, REGINALD ARTHUR. Composition and properties of oat grain and straw. Jour. Agric. Sci. 10: 359-414. Fig. 1-5. 1920.—An extensive study with detailed chemical analyses of the composition of oat grain and straw. Changes during growth, varietal differences, and a large number of correlations of various properties are brought out.—V. H. Young.

771. CERECEDA, J. DANTIN. Catalogo methodico de las plantas cultivadas (especies y variedades) en España y de las principales especies arboreas. [Methodical catalogue of the plants (species and varieties) cultivated in Spain, and of the principal tree species.] 62 p., 22 fig. Servicio de Publicaciones de Agricultores del Ministerio de Fomento: Madrid, 1920.—The classified list gives the botanical and common names for each species and variety cultivated in Spain. The species are grouped according to economic use except in the case of fruit trees, which are exemplified by olive and oranges, and sugar and cereals, which are grouped with reference to climatic adaptations.—C. V. Piper.

772. CLAYTON, E. S. Field experiments with maize. Grafton experiment farm, 1919-1920. Agric. Gaz. New South Wales 32: 1-6. 1921.—In the experiment, hilling vs. flat cultivation of maize, hilling was done by the plow and by disc cultivating. Hilling by plowing decreased the crop but hilling by disc cultivating showed a net increase of crop over the check plats. The main advantage of hilling is that it smothers weeds in the row.—An experiment in de-suckering Leaming maize showed a net loss of about \$1.40 per acre.—In depth of cultivation experiments, deep cultivation during season and deep cultivation followed by shallow cultivation were compared with continuous shallow cultivation. Deep cultivation resulted in loss, and deep followed by shallow cultivation resulted in a small net gain.—In green manuring experiments, the object was to determine value of green manures sown in standing maize at tasseling time where maize is grown as a continuous crop. In the first year of experimenting, rape, vetches, and Grey field peas were used as green manuring crops; yields, when compared with plat receiving usual treatment, were not lessened the first year.—In a late cultivation experiment, maize received no cultivation after hilling (crop 18 inches high) in comparison with usual cultivation after hilling. The latter showed marked net gain per acre.—In rate of seeding trials with 2 varieties, the heavier seedings gave greatest net increases per acre.—L. R. Waldron.

773. CROCKER, WILLIAM. Influence of a crop on succeeding one. [Rev. of: (1) HARTWELL, B. L., and S. C. DAMON. The influence of crop plants on those which follow. Rhode Island Agric. Exp. Sta. Bull. 175. 1918. (2) HARTWELL, B. L., F. R. PEMBER, and G. E. MERKLE. The influence of crop plants on those which follow. Rhode Island Agric. Exp. Sta. Bull. 176. 1919 (see Bot. Absts. 6, Entry 18).] Bot. Gaz. 68: 480-482. 1919.



774. CROSS, WILLIAM E. Ensayos con abonas para la caña de azúcar. [Fertilizers for sugar cane.] Sugar 21: 267-271. 1919.—A discussion of the fertilizer experiments at the Tucuman (Argentina) Experiment Station.—C. W. Edgerton.

775. CROSS, WILLIAM E. Fertilizer experiments with sugar cane in 1918-19. Sugar 21: 633-634, 651. 1919. [A translation from Rev. Indust. Agric. Tucuman 9: Nos. 11-12, 1919.] —A discussion of the effect of various fertilizers upon the development of sugar cane and upon the root-rot disease.—C. W. Edgerton.

776. CROSS, WILLIAM E. The 1919 Tucuman sugar crop. Louisiana Planter and Sugar Manufacturer 64: 364-366. 2 fig. 1920.—Tucuman produced 3,685,000 tons of sugar cane in 1919, this crop being much larger than each of several preceding crops. This increased production is said to be due to the fact that the planters have replaced the native canes with Java seedlings. The Java seedlings are more resistant to the attacks of insects and fungous diseases. Neither mosaic nor root-rot seems to seriously damage these canes.—C. W. Edgerton.

777. CROSS, WILLIAM E. The treatment of cane damaged by frost. Louisiana Planter and Sugar Manufacturer 65: 363-366. 1 fig. 1920.—A discussion of the methods to be used in harvesting frosted cane and of the difficulties that arise during the manufacture of sugar from such cane.—C. W. Edgerton.

778. EDQUIST, ALF. G. Vitality of seeds. Trans. and Proc. Roy. Soc. South Australia 40: 5-10. 1919.—As a result of preliminary experiments on the storage of dry grain, it has been found that perfectly ripe dry grain can be stored in an atmosphere of nitrogen or of carbon dioxide without injury to the grain; at the same time the eggs of weevils and other beetles are prevented from developing. It is maintained that such a method of storage can be provided economically.—J. H. Faull.

779. FRUWIRTH, C. Handbuch des Hülsenfruchterbaues. [Handbook of legume culture.] viii + 231 p., 231 fig. Paul Parey: Berlin, 1921.—This work is in reality a third revised and enlarged edition of the author's "Anbau der Hülsenfrüchte." The general part considers such topics as morphology, physiology, cultural requirements, utilization and agricultural importance. The special part treats in detail many of the legume crop plants, including serradella, lupines, square-pod pea, chick-pea, vetches, lentils, vetchlings, peas, soybean, kidney bean, scarlet runner, mung, urd, lima bean, cowpea, and bonavist.—C. V. Piper.

780. GIL, MIGUEL. El problema del trigo-fertilización. [The problem of wheat fertilization.] Informacion Agric. [Madrid] 10: 482-484. 2 fig. 1920.—The results of tests with sodium nitrate are given.—John A. Stevenson.

781. GILMORE, MELVIN RANDOLPH. Uses of plants by the Indians of the Missouri River region. 33rd Annual Report of the Bureau of American Ethnology 1911-12: 43-154. 30 pl. Washington, D. C., 1919.—This is a list of the various plants, together with methods of utilization, used by the Indians in the region studied, being a continuation of similar accounts of other tribes (see Bureau of Ethnology Bull. 55, and 30th Rept.). A glossary of Indian, English, and scientific names of the plants mentioned is appended; also a bibliography of historical writers quoted.—Lyman Carrier.

782. GRAY, G. P. Weed control along fencerows and roadways. Monthly Bull. Dept. Agric. California 8: 599-603. 1919.—Refers to Publications in Agricultural Science, University of California, Vol. 4, No. 2, 1919. [See Bot. Absts. 3, Entry 470.]—E. L. Overholser.

783. GRIMME, CLEMENS. Ueber Mulatinhos, eine neue brasilianische Speisebohne. [Concerning mulatinhos, a new Brazilian edible bean.] Pharm. Zentralhalle 61: 421-423. 1920.—A chemical study of the mulatinhos bean is given. The bean, apparently a variety of *Phaseolus vulgaris* sub-spec. *compressus*, is small, light brown, and flat with a polished



seed-coat and a white, dark-bordered hilum. It is 10 mm. long, 6 mm. wide, and 3-5 mm. thick. The bean was found to contain 11 per cent of water, 89 per cent of dry substance, 85 per cent of organic substance, 34 per cent of crude protein, 2 per cent of fat, 46.4 per cent of nitrogen-free extract, 3.5 per cent of crude fiber, and 3.6 per cent of ash. After treating with water and then boiling, the contents were found to consist of 69.5 per cent of water, 30.5 per cent of dry substance, 29.6 per cent of organic substance, 10 per cent of crude protein, 0.35 per cent of fat, 18 per cent of nitrogen-free extractive matter, 1.16 per cent of crude fiber, and 0.9 per cent of ash. After boiling with sodium carbonate the respective figures were 75.1, 24.9, 24.1, 7.9, 0.17, 15.2, 0.82, and 0.8 per cent.—*H. Engelhardt.*

784. GROUD, CHARLES. Ramie and textile nettles as paper fiber. Paper 26<sup>18</sup>: 15-16, 30. 1920. [Translation from *Le Papier*, April, 1920.]

785. GUZMANES, ANTONIO. La inmersión de las semillas en líquidos nutritivos. [Soaking seed in nutritive solutions.] *Informacion Agric.* [Madrid] 10: 480-481. 1920.—Seed barley soaked in a solution of ammonium nitrate or in a solution of potassium nitrate for various lengths of time gave lower yields than untreated seed.—*John A. Stevenson.*

786. GUZMANES, ANTONIO. El cultivo del arroz en Valencia. [Rice cultivation in Valencia.] *Informacion Agric.* [Madrid] 10: 453-457. 8 fig. 1920.

787. HARRIS, F. S. The American sugar-beet seed industry. Sugar 22: 68-69, 81. 5 fig. 1920.

788. HEIM, F., J. MAHEU, AND L. MATROD. Suitability of bagasse as a source of paper. Paper 26<sup>28</sup>: 11-14, 36. 14 fig. 1920.—[Translation from *La Papeterie* 62: June-July, 1920.] A complete description of the histology of the stem, giving dimensions of the elements, the chemistry and microchemistry of the fiber, and properties and uses of pulp obtained therefrom.—*H. N. Lee.*

789. HODSON, E. A. Results of seven year's selection in Trice cotton. Arkansas Agric. Exp. Sta. Bull. 171. 27 p., 10 fig. 1920.—Seven years of continuous selection in Trice cotton showed that wide fluctuations occurred which emphasize the need of continuous selection in order to preserve the characters of the strain.—*John A. Elliott.*

790. JONES, D. F. Produccion de semillas para sembrar. [Seed production.] *El Agricultor* [Santiago, Chile] 5: 7-12. 8 fig. 1920.—[Reprinted from *La Hacienda*.]

791. JONES, J. S., C. W. COLVER, AND H. P. FISHBURN. The protein content of wheat grown with irrigation. Jour. Agric. Sci. 10: 290-332. Fig. 1-11. 1920.—The published data on the subject of protein content of wheat are very conflicting and the authors conducted a series of experiments during the years 1910-1916, inclusive, in an attempt to elucidate the problem. The work was carried out at Gooding, Idaho, in the Snake River valley. This is a region of low precipitation and for this reason the water applied to the crop as irrigation water was practically all that it received. Soils used varied from raw sagebrush land to that cultivated under rotation with legumes and other crops. Analyses of the nitrate and other mineral content of the soils were made and the effects of cropping, rotation, leaching, etc., were determined. Both the grain and the flour produced were analyzed throughout the experiments. Authors' results do not coincide with those obtained in many other experiments. They find that in general the wheat grown in the Snake River plains is soft, starchy, and low in protein content and of low value for milling purposes. It should not be assumed, however, that irrigation is the controlling factor in determining the protein content of wheat. Raw sage-brush soils, the nitrogen content of which is always low, produce wheat low in protein content regardless of the amount of water applied. As soon as such lands are cultivated to wheat in a rotation with alfalfa or red clover, a much better quality of wheat is produced, as such soils have a relatively higher nitrogen content and the protein



content of the wheat is correspondingly improved. Carelessness in the use of water may offset, to some extent, other favorable conditions since the maximum protein content was never obtained with the greatest amounts of irrigation water. Deterioration of seed due to growth in irrigated regions has no effect upon protein content of the crop and there is no advantage in securing seed from non-irrigated regions. However, there is much to be gained in selecting varieties of wheat having characteristically high protein content. Evidence suggests that from this point of view hard, red, spring wheat would be worth at least a trial.—*V. H. Young.*

792. KOFAHL, H. Der gehörnte Schotenklee. [The horned pod clover (*Lotus corniculatus*).] *Illus. Landw. Zeitg.* 41: 146-147. 1921.—This plant is recommended as a perennial leguminous forage plant in sections of Germany where alfalfa cannot be successfully grown. It grows best on a fertile soil having a clay subsoil and free from weeds, especially couch grass; it should be grown with oats or barley. The first cutting is the most productive. It appears to be long-lived and entirely resistant to winter killing. The best yield of seed is from the 2nd cutting. As forage, it is well liked by both cattle and swine.—*John W. Roberts.*

793. KRESS, OTTO. Cooking cotton hull fiber for pulp. *Paper* 25: 964-968, 1009-1011. 1920.

794. MAIDEN, J. H. Chats about the prickly pear. No. 8. *Agric. Gaz. New South Wales* 32: 45-48. 1 *fig.* 1921.—A discussion of extermination methods is presented. It has been found that cutting just below the surface of the ground, followed by thorough spraying with suitable poisons, generally kills the plant.—*L. R. Waldron.*

795. MAKIN, R. N. Farmers' experiment plots. Potato experiments, 1919-20, Cotta Walla-Crookwell District. *Agric. Gaz. New South Wales* 32: 7-9. 1921.—Variety trials carried on in cooperation with 3 farmers showed considerable variations in yield. One variety, Factor, yielded best, and Magnum Bonum and Early Manistee are recommended.—*L. R. Waldron.*

796. MALTE, M. O. Breeding methods in forage plants. *Sci. Agric. [Canada]* 1: 25-29. 1921.—A paper read before the Western Canadian Society of Agronomy and confined to breeding methods of a practical nature applicable to grasses, alfalfa, and red clover in Western Canada. Author found that in western rye grass (*Agropyrum tenerum* Vasey) and in other species of *Agropyrum*, self-fertilization regularly takes place. It is thus possible to work with many forms without the necessity of isolation. With alfalfa imperfect seed formation is due to defective sexual organs and frequently to unsuitable environmental conditions. In the case of red clover mass-selection brings results in a comparatively short time and is of practical importance.—*B. T. Dickson.*

797. NEIDIG, RAY E. Sugar beet top silage. *Jour. Agric. Res.* 20: 537-542. 1921.—Chemical analyses of average beet top silage, as found on the farm. Careless ensiling may allow abnormal fermentation, with possible production of substances toxic to animals.—*D. Reddick.*

798. OPAZO, ROBERTO. Cultivo y industria del azucar de betarraga. [Cultivation of the sugar beet.] *El Agricultor [Santiago, Chile]* 5: 120-122. 1920.—Discusses the possibility of a sugar beet industry in Chile.—*John A. Stevenson.*

799. OPAZO, ROBERTO. Cultivo de plantas oleaginosas. [Cultivation of oil plants.] *El Agricultor [Santiago, Chile]* 5: 195-198. 1920.—Discusses the cultivation of the peanut, sunflower, soybean, sesamum, and poppy as oil plants.—*John A. Stevenson.*

800. OPAZO, ROBERTO. Preparación de terrenos para la siembra de chacras. [Cultivation of small farms.] *El Agricultor [Santiago, Chile]* 5: 165-166. 1920.—Recommends seed selection of corn, sorghum, and other crops to be grown on small holdings and gives general cultural directions.—*John A. Stevenson.*

801. OPAZO, ROBERTO. Siembras de cebada y de avena. [Seeding barley and oats.] *El Agricultor [Santiago, Chile]* 5: 147-148. 1920.



802. OPAZO, ROBERTO. Siembras de trigo. [Planting wheat.] El Agricultor [Santiago, Chile] 5: 70-73. 1920.—A general discussion of wheat growing in Chile, including soil types, manner of sowing, fertilizers used, and cultivation methods.—*John A. Stevenson.*

803. PITT, J. M. Farmers' experiment plots. Summer fodder experiments, 1919-20. Central coast. Agric. Gaz. New South Wales 31: 805-808. 1 fig. 1920.—In cooperation with farmers, trials were conducted with Sudan grass, sachaline, Planter's Friend sorghum, and Japanese millet. The maximum yield, 36 tons of green fodder per acre, was secured from sachaline, plants attaining a height of 13 feet. Sudan grass grew 8 feet in 11 weeks.—*L. R. Waldron.*

804. PRIDHAM, J. T. Varieties of wheat tested in New South Wales. Agric. Gaz. New South Wales 32: 10-19. 1921.—A total of 249 varieties of wheat are listed, including 59 duplicates. Notes are given as to season, utilization, character of grain, origin, adaptations, defects, good points, and distinguishing characters.—*L. R. Waldron.*

805. QUEREAU, F. C. The amount of salt in irrigation water injurious to rice. Louisiana Agric. Exp. Sta. Bull. 171. 14 p., 8 fig. 1920.—Irrigation water is liable to contain salt during periods of drought. Pot and field experiments show that water containing 35 grains or more of salt to the gallon is liable to be injurious to rice.—*C. W. Edgerton.*

806. QUEREAU, F. C. Rice investigations. Louisiana Agric. Exp. Sta. Bull. 172. 87 p., 35 fig. 1920.—This bulletin discusses the various investigations that have been carried on with rice in the rice belt of Louisiana. In the fertilizer experiments, the best results were obtained with fertilizers that contained phosphoric acid. Potash does not seem to be necessary.—The rotation experiments showed that short rotations are not profitable, due to the high overhead expense necessitated by the change from rice to highland crops. The rotation recommended is 5-7 years in rice followed by the same period in other crops.—Red rice is one of the most important difficulties of the rice farmer. Methods for controlling red rice include rotation, use of cover crops, and pasturage. Crude oil has been found useful in controlling the root maggot. The principal rice diseases are rotten neck or blast (*Piricularia oryzae*) and straight head. The rotten neck disease occurs both in young and old plants. The straight head is most common on ground that produced a crop other than rice the preceding year. Straight head rarely develops in fields that have been drained during the season.—The best methods of growing, fertilizing, and harvesting rice are given. The estimated cost of growing an acre of rice in 1910 was \$27.26, while in 1917-1918 it was \$31.95.—*C. W. Edgerton.*

807. RINDL, M. Vegetable fats and oils. IV, and V. Semi-drying oils. South African Jour. Indust. 3: 518-531, 742-749. 1920.

808. RÍOS, P. GONZALEZ. La producción de nuevas variedades de caña. [The production of new cane varieties.] Sugar 21: 218-221. 8 fig. 1919.—Discusses the production of sugar cane seed and the growing of sugar cane seedlings.—*C. W. Edgerton.*

809. ROBERTS, HERBERT F. The relation of protein content to variety types in American wheat. Jour. Agric. Sci. 10: 121-134. 1920.—Author reviews and analyzes several papers on the protein content of American wheat and its relation to variety and climate. A short and comparatively dry growing season, especially in spring in the case of winter wheat, favors the development of grain high in protein content. Water supply is the most important factor in determining the starch-protein ratio. Higher rainfall or a greater amount of irrigation water increases the proportion of starch in wheat. The protein content of wheat increases from east to west with the exception of the Pacific Coast region, which in general produces wheat lowest in proteins. There is considerable variation in the starch-protein ratio within definite varieties. Mediterranean durums are highest, Russian durums are next, and bread wheats are lowest in protein content. In given regions the variation in protein content for



different varieties of wheat is from less than 1 per cent to more than 3 per cent. In many regions, the varieties most favored by farmers have been shown to be those varying most in the starch-protein ratio. This is true of Club wheat in California, and, in the order named, of Bluestem, Little Club, Turkey Red, Jones' Winter Fife, and Forty-fold in Washington. Since variation in protein is a varietal characteristic in wheat, author concludes that in breeding for general purposes, wheat strains should be sought which vary in the starch-protein ratio, since this indicates that they have a greater climatic adaptability. In breeding for a limited locality, wheat with a maximum protein content and with the least possible variation with respect thereto is to be sought.—*V. H. Young.*

810. ROSENFELD, ARTHUR H. Problems of cane fertilization. Sugar 21: 24-26, 118-119. 1919.—The results of several years' experiments with various fertilizers on sugar cane are not consistent and consequently none of the fertilizers tried is recommended. Rotation and the use of legumes are advocated.—*C. W. Edgerton.*

811. ROSENFELD, ARTHUR H. Further experiments in fertilizing cane. Sugar 22: 662-664. 1920.—No definite conclusions can be drawn from the various fertilizer experiments which have been conducted at the Tucuman (Argentina) Experiment Station, as the results have not been consistent.—*C. W. Edgerton.*

812. SCHROEDER, H. Die jährliche Gesamtproduction der grünen Pflanzendecke der Erde. [The annual production of the vegetation of the globe.] Naturwissenschaften 7: 8-12, 23-29. 1919.—This is in reality a calculation of the total quantity of CO<sub>2</sub> consumed annually by green plants. The author briefly reviews previous papers and proceeds to consider the land surface of the globe as consisting of forest, agricultural land, steppe, and desert. For each of these divisions various calculations are made based upon available data together with such corrections as the author considers necessary. For instance, he takes Ebermayer's determination that in the Bavarian forests 3000 kgm. of carbon are fixed annually per hectare; taking into account the fact that the vast areas of circumpolar and mountain forests must fix less, although tropical and subtropical forests probably fix more, the author considers that this figure should be reduced by 1/6, and that 2500 kgm. per hectare is nearer a true average. Much space is devoted to a discussion of the principal crop plants, wheat, rye, barley, oats, maize, potatoes, and rice, and the author concludes that these plants fix 1600 kgm. of carbon per hectare annually. This figure includes grain, straw, and the roots and stubble left on the field. Forage crops, such as clovers, sorghums, peas, soybeans, green maize, as well as sugar, are believed to fix on the average about the same amount of carbon as the grains. Steppe and desert vegetation can only be estimated and there is a large margin of possible error. The final figures are given in table 15 (p. 27). To these he adds an estimate of the carbon fixed by the benthos, and arrives at 60 billion kgm., with limits of 50 and 80 billions, as the quantity of CO<sub>2</sub> annually consumed by green plants. Of these 60 billions, 40 are consumed by forest, 14 by agricultural, 4 by steppe, and 1 by desert plants. The author also discusses briefly the return of CO<sub>2</sub> to the air by decay and other means, but concludes that the quantitative data are too scanty to warrant even a guess. The total CO<sub>2</sub> of the atmosphere being 2100 billion kgm., it follows that unless replaced the available supply would be exhausted in about 30 years.—*A. J. Pieters.*

813. SHEPHERD, A. N. The Tick bean. (*Vicia faba*.) A green manure crop for irrigation areas. Agric. Gaz. New South Wales 32: 42-44. 2 fig. 1921.—Tick beans were grown on a plot in the Murrumbidgee irrigation area with good results. In consequence of several irrigations, over 15.5 tons of green crop—easily turned under—were produced per acre. It was calculated the crop returned to the land 145 pounds of nitrogen (as ammonia) per acre.—*L. R. Waldron.*

814. SMEDING, S. Ervaringen omtrent de cultuur op de in 1916 overstroomde gronden in de Anna Paulawnapolder. [Experiences on crop growing in the 1916 inundated lands of the Anna Paulawnapolder.] Cultura 32: 1-29, 60-64. 1920.—In 1916 some low lands in the prov-



ince of North Holland, Netherlands, were inundated by sea water. At first many farm crops could not be grown. The soil had to be cultivated thoroughly to prevent excessive evaporation due to capillary action, which would result in an increase of salt content toward the soil surface. Proper drainage by pumping machines was advised. Heavy soils rather than lighter ones were sensitive to deep plowing. Deep fall plowing on inundated lands is not advisable. Spring treatment of the soil must be superficial, and only the cultivator and harrow should be used to prepare the seed bed.—The first year sugar beets and mangel-wurzels proved resistant to salty soil; spring barley also succeeded; mustard did fairly well; alfalfa prospered only on lighter soils; red clover was everywhere poor. The growing of oats, peas, spinach, potatoes, and cabbage was impossible.—The second year, 1917, the soil contained less salt, though its structure was not normal. However, the early summer was dry and a good harvest was obtained from sugar beets, mangel-wurzel, spinach, radish, and spring barley; on lighter soils spring barley, mustard, red clover, and alfalfa did well; wheat, oats, and flax were fairly good; white and brown beans were a failure.—The third year, 1918, the salt had diminished to such an extent that it no longer affected field crops though the structure of the heavy soils still remained abnormal. On lighter soils good harvests of spinach, radish, oats, spring barley, cabbage, broad beans, and peas were obtained. On heavy soils most crops, including beets, were not as good as in the previous year.—*J. C. Th. Uphof.*

815. SOUTHWORTH, W. A study of the influence of the root system in promoting hardiness in alfalfa. *Sci. Agric. [Canada]* 1: 5-9. 1921.—A paper read before the Western Canadian Society of Agronomy dealing with experiments carried on at the Ontario and Manitoba Agricultural Colleges. Plants possessing a branched root system are better able to withstand winter heaving than those having only a single taproot. Plants which develop rooting underground stems are able to maintain themselves after the death of the main rootstock. When alfalfa has the habit of spreading by root proliferation, the plant is better able to recuperate from injury and to withstand cold. Such plants are usually less nutritious and palatable and work is in progress at the latter institution to remedy these defects.—*B. T. Dickson.*

816. STAPLEDON, R. G. Seed studies: red clover with special reference to the country of origin of the seed. *Jour. Agric. Sci.* 10: 90-120. 1920.—The country of origin of seeds of various cultivated plants is important in determining the value of the crop for various purposes. In England, clover seed from various sources varies greatly in the yield produced and the value of the crop. Home-grown seed appears to be best for most uses. To a certain extent the type of weed seeds found in clover is valuable in determining its source, but the source of cleaned and blended seed can hardly be determined in this way. Author has worked out a system of classification of seeds of red clover based on germinating power, average size, and proportion of different colored seeds. Seeds were classed according to color as yellow, violet, and brown, and the various color variations, mottlings, etc., included with each color are described. The proportion of "hard" seed was also determined. The results of an exhaustive study of seed from two seasons' crops has enabled the author to give definite criteria for the determination of the country of origin of clover seed and also has shown that there is a definite coordination between the physical characteristics of clover seed and its value for a definite purpose.—*V. H. Young.*

817. STENT, SYDNEY M. Kudzu (*Pueraria thunbergiana*). [Rev. of: PIPER, C. V. Kudzu. U. S. Dept. Agric. Dept. Circ. 89. 7 p. 1920 (see Bot. Absts. 6, Entry 1428).] *Jour. Dept. Agric. Union of South Africa* 1: 558-560. 1920.—Brief comment on adaptability and source of seed.—*E. M. Doidge.*

818. STIETZ, G. E. G. Sugar cane culture in Java. *Louisiana Planter and Sugar Manufacturer* 65: 219. 1920.

819. TAGGART, W. G. Louisiana seedling canes. *Sugar* 21: 426-429, 439. 1919.—The Louisiana Experiment Station has been growing seedling canes for a number of years. The seed was obtained from various tropical countries. Cane seed usually germinates very



poorly and generally only a few plants are obtained from a shipment of seed. Of the several hundred seedlings which have been grown, only a very few show particular merit. The most valuable seem to be the L 253 and L 511. The L 253 seedling produces a very heavy tonnage but the sugar content is no better than that of the native canes. The L 511 seedling is a cane richer in sucrose than any of the canes ordinarily grown in Louisiana.—*C. W. Edgerton.*

820. TAGUE, E. L. Changes taking place in the tempering of wheat. *Jour. Agric. Res.* 20: 271-275. 1920 [1921].—Improvement in the milling quality of wheat is effected by moistening the grain. Hard wheats are improved more than soft ones and dry wheats are improved more than wet ones. Improved milling quality of tempered wheat is due chiefly to physical changes. The optimum conditions are: Temperature 20 to 25°C., time 48 hours, moisture 15.5 per cent.—*D. Reddick.*

821. WEST, CLARENCE J. Paper from bagasse. Paper 26: 62-64. 1920.—A description of the method used in making paper pulp from sugar cane refuse.—*H. N. Lee.*

822. WEST, CLARENCE J. Possibilities of African grasses in paper manufacture. Paper 26<sup>10</sup>: 10. 1920.—A condensed analysis of African grasses, summarizing their possibilities in the manufacture of paper.—*H. N. Lee.*

823. ZAYAS, M. Cultivo de las judias. [Bean cultivation.] *Informacion Agric.* [Madrid] 10: 526-528. 2 fig. 1920.

## BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

NEIL E. STEVENS, *Editor*

(See also in this issue Entries 781, 954, 1035, 1109, 1288, 1536, 1539, 1544)

824. ANONYMOUS. Canadian Branch of the American Phytopathological Society. *Sci. Agric.* 1: 18. 1921.—An account of the second annual meeting of the above branch held in the Biological Building at the Ontario Agricultural College on Dec. 9 and 10, 1920.—*B. T. Dickson.*

825. ANONYMOUS. Édouard Prillieux. *Ann. Service Épiphyties* 4: 1-16. *Portrait.* 1917 [1919].—Édouard Ernest Prillieux, "the founder of phytopathology in France," was born in Paris, Jan. 11, 1829, and died Oct. 6, 1915, at Mondoubleau (Loir-et-Cher). He was educated at the old Institut National Agronomique (1848-1853), and immediately devoted himself to the problems of vegetable pathology, particularly diseases of the vine. In 1887 he founded the Station de Pathologie Végétale at Paris, and in 1894 furthered the establishment of the Station Entomologique. A portion of the article is given to analysis of Prillieux' scientific researches, and there follows a classified list of his publications, 184 in number.—*M. F. Warner.*

826. ANONYMOUS. Die Forste und der Friedensvertrag. [Forests and the peace treaty.] *Allg. Forst- u. Jagdzeitg.* 38: 70. 1920.—Hungary loses over half of her coniferous forest to Roumania, 36 per cent to Czecho-Slovakia, and 11 per cent to Jugo-Slavia. The situation is similar in respect to beech and oak, so that the once well forested Hungary is reduced to a wood importing country.—*F. S. Baker.*

827. BARNHART, J. H. Brackenridge and his book on ferns. *Jour. New York Bot. Gard.* 20: 117-124. 1919.—This sketch of William D. Brackenridge (1810-1893) deals particularly with his part in the Wilkes Exploring Expedition and with the preparation of his work on ferns.—*Neil E. Stevens.*

828. BARNHART, J. H. Historical sketch of the Torrey Botanical Club. *Mem. Torrey Bot. Club* 17: 12-21. 1918.—This sketch deals especially with the formation and work of the



society and is followed by reminiscences of the early days and former members by, H. M. DENSLOW (p. 22-23), N. L. BRITTON (p. 24-28), and ARTHUR HOLLICK (p. 29-30).—*Neil E. Stevens.*

829. BARNHART, J. H. Some fictitious botanists. *Jour. New York Bot. Gard.* 20: 171-181. 1919.—Fourteen so-called "botanists" from Appleton's *Cyclopedia of American Biography* are listed, and evidence is presented to show that their supposed biographical accounts are fictitious.—*Neil E. Stevens.*

830. BATESON, W[ILLIAM]. The late Mr. R. P. Gregory. *Nature* 102: 284. 1918.—See *Bot. Absts.* 5, Entry 1234.

831. BOIS, DÉSIRÉ. Notice sur M. Maurice Lévêque de Vilmorin. *Bull. Soc. Bot. France* 66: 140-143. 1919.—Auguste-Louis-Maurice Lévêque de Vilmorin (1849-1918) was especially interested in forest botany and the study of fruit and ornamental trees. A list of 20 of his publications is given.—*B. O. Dodge.*

832. BOULGER, G. S., AND JAMES BRITTEN. Joseph Andrews and his herbarium. *Jour. Botany* 56: 257-261. 1918.—The British Museum (Natural History) contains a collection of plants formed at Sudbury by the apothecary Joseph Andrews, between 1710 and 1757. Andrews was a friend of Dale, and probably the man appointed in 1707 as inspector of the Chelsea Garden, together with Wyche and Petiver. He is mentioned in Dillenius' edition of Ray's *Synopsis Methodica Plantarum Britannicarum*, ed. 3, 1724, though it is not certain that Dillenius was acquainted with Andrews, whose specimens are numbered in accordance with the 2d ed. of Ray's *Synopsis*, but Andrews owned a copy of the Dillenian edition, afterwards owned by the late W. A. Clarke, which contains a few marginal notes and references to other authors.—*M. F. Warner.*

833. B[OWER], F. O. Prof. William Gilson Farlow. *Nature* 103: 509. 1919.—See also *Bot. Absts.* 6, Entries 916, 947, 956, 963, 1463, 1470.

834. BRIQUET, JOHN. Notice sur la vie et les travaux botaniques de Louis Naville (1843-1916). *Ann. Conservatoire et Jard. Bot. Genève* 20: 215-221. *Portrait.* 1919.—Constant-Louis Naville of Geneva was a man of letters whose avocations were botany and mountain climbing. He made numerous explorations throughout the Swiss Alps, Savoy, and Dauphiny, collecting an herbarium of 3001 numbers, which he gave to the Conservatoire Botanique of Geneva. He published nothing save a popular article, "La flore du Salève," in 1885.—*M. F. Warner.*

835. BUNYARD, E. A. Cotton's "Planter's Manual." *Gard. Chron.* III, 63: 174-175. 1918.—Published in 1675, by Charles Cotton, known as a poet and for his association with Walton's Compleat Angler. Although from the preface it would appear that the book is by Cotton himself, it is actually a translation from the "Instructions pour les arbres fruitiers" first published 1653, by "M. R. T. P. D. S. M.," i.e., M. Robert Triquet, prieur de St. Marc, who in turn was only editor, as the preface states that the book was written by François Vautier, physician to Louis XIV.—*M. F. Warner.*

836. BUNYARD, E. A. Henry van Oosten and the "Dutch gardener." *Jour. Pomology* 1: 37-40. 1919.—For its pomological sources the "Dutch gardener" goes back to LA QUINTINYE, "Instructions pour les jardins potagers et fruitiers," pirated edition by DESBORDES, Amsterdam, 1699, which contains "L'Art de tailler les arbres fruitiers," condensed from VENETTE's book of the same title (1683). Mentions English translation of Venette (1685), and hints that it may have been by EVELYN, as certain phrases have "his unmistakeable ring about them." Mr. Bunyard does not give the earliest Dutch edition of van Oosten, but mentions the English ones of 1703 and 1711, the German of 1706 under title: "Niederlandischer blumen obst und orangeriegarten," the French under title: "Le jardin d' Hollande." He finds that van Oosten borrowed the material on oranges directly from La Quintinye himself.—*M. F. Warner.*



837. BUNYARD, E. A. The history of cultivated fruits, as told in the lives of great pomologists. Robert Thompson. Gard. Chron. III, 63: 121-122. *Portrait*. 1918.—“His work as a pomologist, especially in the rectification of nomenclature, places him in the first rank.” The present article deals with his work on the Catalogue of fruits cultivated in the Garden of the Horticultural Society of London, in the Pomological Magazine, Loudon's Encyclopaedia of gardening (new ed., 1835), in the Transactions of the Horticultural Society, and especially emphasizes the value of his “Gardener's assistant,” first published in 1859. Few details of his life are given, save the record from Thompson's own hand in the book at Chiswick, on his admission there Oct. 21, 1824, in which he states that he was born in the parish of Echt, in the County of Aberdeenshire, in the year 1799, and not 1798, which is commonly accepted as the date of his birth. He died in 1869. To this article is appended a letter from BRIAN WYNNE, giving some recollections of Thompson in his later years.—*M. F. Warner*.

838. BUNYARD, E. A. Some old English apples. Gard. Chron. III, 63: 219-220. 1918.—Keddleston Pippin, known in 1830, and in high favor in 1833; Gennet Moyle, still grown in Cornwall, dating back to Evelyn's day, and celebrated by Philipps in his poem on cider. The word Gennet is probably derived from the French Jeannette, and as our Juneating or Jenneting is probably from Gennet, the apple should therefore be spelled Genneting or Jen-netting. The Old Pearmain, not identical with apple of same name in KNIGHT's “Pomona Herefordiensis;” Orange Pippin also differs from that figured by HOGG and BULL in the “Herefordshire Pomona.”—*M. F. Warner*.

839. CARDOT, JULES. [Letter to E. B. Chamberlain.] *Torreya* 19: 33. 1919.—Portion of a letter describing the devastation of his herbarium and library at Charleville, France, by the German invaders.—*Neil E. Stevens*

840. CARPENTIER, A. L'abbé Félix-Charles Hy (1853-1918). *Rev. Gén. Bot.* 30: 369-376. 1918.—Brief account of the life and work of M. Hy, for 40 years professor of botany at the Université Catholique of Angers. A chronological list of his publications is appended, 64 in number.—*Neil E. Stevens*.

841. CARQUEJA, BENTO. Barão de Soutelinho. *Broteria Ser. Bot.* 16: 25-28. *Portrait*. 1918.—ALFRED TAIT, Baron de Soutelinho, died March 16, 1917. He introduced many useful plants into Portugal. Was primarily a floriculturist, specializing on narcissus, chrysanthemums, and cactus dahlias. Rediscovered *Narcissus cyclamineus* in Portugal near Porto.—*M. F. Warner*.

842. CHODAT, ROBERT. Richard-Emile-Augustin de Candolle. *Arch. Sci. Phys. et Nat.* 2: 169-175. 1920.—Augustin de Candolle (1868-1920) was the fourth of a distinguished line of botanists, being preceded by his father, CASIMIR DE CANDOLLE, his grandfather, ALPHONSE DE CANDOLLE, and his great-grandfather, AUG.-PYR. DE CANDOLLE. The contributions of Augustin de Candolle to botanical science include physiology, morphology, and taxonomy. This account of his life by Professor Chodat is followed by a complete list of publications.—*J. H. Faull*.

843. CHURCH, A. H. Bibliographical notes, LXXIV. Baxter's ‘British phaenogamous botany.’ *Jour. Botany* 57: 58-63. 1919.—Issued in monthly parts of 4 plates and text, from Sept. 1832 to Mar. 1843, this issue being regarded as the first edition, and complete sets are inscribed second edition only on the title of the first volume. The reprint in 1856 was in no sense a third edition. The differences in title of the monthly parts and complete volumes are given, with dates and inclusive plate numbers for each of the 6 volumes. Author comments on the merits of the plates, and gives an estimate of the value of Baxter's work.—*M. F. Warner*.

844. COBB, RUTH. Periodical bibliographies and abstracts for the scientific and technological journals of the world. *Bull. Nation. Res. Council* 1: 131-154. 1920.—A partial list of serials regularly containing bibliographies or abstracts in various fields of science, each



title being given as a rule under all the subjects covered by it. Most of those relating to bibliography of Pathology are listed under Botany, but others of interest are given only under Bacteriology. The topics Agriculture and Forestry and Medical Sciences also include matter of interest to the botanist, but no place is provided for general biology or genetics.—*M. F. Warner.*

845. DELAUNAY, PAUL. *Un botaniste manceau, Hector Lèveillé (1863–1918)*. Bull. Géog. Bot. 27: 57–96. 1919.—An enthusiastic account, with bibliography, of the varied activities of l'abbé Leveillé not only in the field of botany, but in the organization of learned societies, and the study of anthropology, geography, history, biography, and archeology. As a botanist he was best known for his studies of regional floras.—*Neil E. Stevens.*

846. [DUDGEON, WINFIELD.] *The Indian Botanical Society*. 12 p. Allahabad, 1920.—This society "for uniting the botanists and promoting the botanical interests of India" was organized in 1920. The history of its organization together with the provisional constitution and list of charter members is here printed.—*Neil E. Stevens.*

847. DURHAM, H. E. *Philological notes*. Gard. Chron. III, 64: 146–147. 1918.—Origin and associations of the following: "Bloom," corresponding to the French "fleur," whence possibly some of the apples known as Belle Fleur; "pruine" from prune; the Pearmain or Parmayns, for which numerous derivations have been suggested, to which the author adds the possibility that the name may have come from the French "permaindre" or "parmaindre" (Latin "permanere"), because of the lasting quality of the fruits originally so called.—*M. F. Warner.*

848. DYKES, W. B. *Did the tulip mania ever reach Italy?* Garden 83: 528. 1919.—In response to an inquiry author says that Mattei in his article "I tulipani di Bologna," Malpighia, 1893, p. 15, states as a matter of course that when the mania was at its height in Holland in 1634 there were "maniacs" also in Florence, Bologna, and elsewhere.—*M. F. Warner.*

849. FAIRBRIDGE, DOROTHEA. *Vergelegen*. South African Gard. 9: 408–409. *Illus.* 1919.—An estate at Cape of Good Hope granted in 1700 to Governor WILLEM ADRIAAN VAN DER STEL, who cultivated here at the beginning of the 18th century a great variety of European vegetables, also interesting himself in food possibilities of the native plants. He grew tulips and Ceylon bulbs, and both he and his father, SIMON VAN DER STEL, sent quantities of Cape bulbs to Holland. He introduced the white mulberry into cultivation at the Cape. His manuscript on gardening, now in the South African Public Library, which was published in 1825 in the African Court calendar as an issue of the "African gardeners' and agriculturists' calendar," contains mention of diseases of fruit trees.—*M. F. Warner.*

850. FAIRCHILD, DAVID. *Byron David Halsted, botanist (1852–1918)*. Phytopath. 9: 1–6. *Portrait*. 1919.—An intimate and interesting personal sketch of Dr. Halsted and his methods of work, by his nephew.—*Neil E. Stevens.*

851. FARQUHARSON, C. O. *Charles Ogilvie Farquharson and his work in West Africa*. Kew Bull. Misc. Inform. 1918: 353–361. 1918.—Letter to the Assistant Director at Kew, with prefatory note stating that Farquharson died Oct. 3, 1918. "A remarkably graphic epitome of his life work in Nigeria. The nature of the work, the methods by which he sought to solve the many difficult problems, and the kind of education that his experience had led him to believe best for such work are all fully discussed."—*M. F. Warner.*

852. FLETCHER, S. W. *One hundred years of strawberry growing in North America*. Proc. Amer. Pomol. Soc. 35: 125–132. 1918.—Commercial history. Although native berries abounded, and plants were brought from the fields and cultivated by the colonists as early as 1700, there was no attempt to grow for the market until after 1800.—*M. F. Warner.*



853. FOX, R. H. **Dr. John Fothergill and his friends (chapters in eighteenth century life).** xxxiv + 434 p., *frontispiece, plates, portraits*. Macmillan & Co., Ltd.: London, 1919.—See Bot. Absts. 6, Entry 911.

854. GEDDES, PATRICK. **The life and work of Sir Jagadis C. Bose.** xii + 259 p., *frontispiece, illus., pl., portrait*. Longmans, Green & Co.: London, New York, 1920.—The education of Dr. Bose (born 1858) and his researches on the irritability of plants and related subjects are discussed. The two concluding chapters are devoted to a description of the Bose Institute, and to the address delivered by Dr. Bose at its dedication. [See Bot. Absts. 8, Entry 58.]-*Neil E. Stevens.*

855. GIRARD, A. C. **Achille Müntz, 1846-1917.** Ann. Inst. Nation. Agron. II, 13: 171-217. *Portrait*. 1918.—Charles-Achille Muntz was connected with the Institut National Agronomique at Paris from 1876 to the close of his life. He was primarily an agricultural chemist, but among his nearly 300 publications listed on p. 206-217 are many on crop plants and physiology.—*Neil E. Stevens.*

856. GRAVES, F. M. **On the walled garden.** Gard. Chron. III, 65: 105-106. 1919.—Translated from "Le Menagier de Paris," written between June 1392 and September 1394, and published by the Société des Bibliophiles Français in 1846. The present portion, translated from the section on "Courtillage," deals with the cultivation of vegetables, flowers, and herbs, indicating the extensive number of plants then cultivated, with brief suggestions on grafting.—*M. F. Warner.*

857. GRINDLEY, F. H. **The history, progress and future of the C. S. T. A.** Sci. Agric. 1: 10-12. 1921.—An account by the General Secretary-Treasurer of the formation of the Canadian Society of Technical Agriculturists. The Society aims at raising the status of scientific agriculture in Canada and, by means of its official organ "Scientific Agriculture," giving publicity to experimentation and research carried on not only in Canada, but elsewhere when applicable to Canadian conditions.—*B. T. Dickson.*

858. G[ROVE], W. B. **James Eustace Bagnall, A. L. S. (1830-1918).** Jour. Botany 56: 354-356. 1918.—His active life spent in business in Birmingham, his recreations were the study of the local flora and of mosses. Wrote: "Handbook of mosses" (1886); "The Flora of Warwickshire" (1891); "The Flora of Staffordshire" (1901), and numerous articles in journals.—*M. F. Warner.*

859. GÜSSOW, H. T. **Establishment of an Imperial (British) bureau of mycology.** Phytopath. 9: 265. 1919.

860. HABERLANDT, GOTTLIEB. **Grabrede auf Simon Schwendener am 2 Juni 1919.** [Funeral oration for Simon Schwendener.] Naturwiss. Wochenschr. N. F., 18: 417. 1919.

861. HEDRICK, U. P. **Edward Lewis Sturtevant.** Rept. New York Agric. Exp. Sta. [Geneva] 1919<sup>2</sup>: 1-16. *Portrait*. 1919 [1920]. Published as 27th Ann. Rept. New York State Dept. Agric. Vol. 2, part 2.—"Edward Lewis Sturtevant. farmer, botanist, physician, and author was one of the giants of his time in the science of agriculture." Born, Jan. 23, 1842, died, Jan. 19, 1879. Educated at Bowdoin and Harvard Medical School. Conducted systematic experiments privately 1875-1880. Director New York State Agricultural Experiment Station 1882-1887. A bibliography of 89 titles covering his principal scientific writings is appended.—*D. Reddick.*

862. HEDRICK, U. P., Editor. **Sturtevant's notes on edible plants.** Rept. New York Agric. Exp. Sta. [Geneva] 1919<sup>2</sup>: 17-686. 1919 [1920]. Published as 27th Ann. Rept. New York State Dept. Agric. Vol. 2, part 2.—Materials selected from following sources: An extensive manuscript owned by the New York Experiment Station, a mass of index cards located there and at the Missouri Botanical Garden, and Sturtevant's published work on the history



of esculents in the Station reports and American Naturalist. The researches into the origin and development of cultivated plants have been combined with hundreds of notes on local and aboriginal uses as food, and arranged in a single alphabet under specific names of plants, with bibliographical citations reduced to footnotes and a list of "Authors and titles quoted in Sturtevant's notes on edible plants" appended (p. 625-667). Separate indexes to botanical synonyms and vernacular names.—*D. Reddick.*

863. HENRIQUES, J. A. J. F. *Correa da Serra*. *Broteria Ser. Bot.* 16: 104-112. 1918.—José Francisco Correa da Serra was born at Serpa June 6, 1750, and died in 1823. Although an ecclesiastic, he held several diplomatic positions, among them that of Minister of Portugal to the United States. As naturalist he was especially interested in geology and botany, publishing papers in the latter subject in *Ann. Mus. Hist. Nat. Paris*, *Phil. Trans. Roy. Soc. London*, *Trans. Amer. Phil. Soc.*, and other journals.—*M. F. Warner.*

864. HENRY, AUGUSTINE. *The cedars of Lebanon. References to the trees of great age that form the nucleus of the historic grove.* *Sci. Amer. Suppl.* 87: 295. 1919. (From *Country Life* [London].)—The grove of cedars near Bsherreh has been celebrated for centuries, and many travellers have counted its principal trees, which have gradually decreased in number. BELON visited Mount Lebanon in 1550 and counted 28 great trees, while Sir JOSEPH HOOKER in 1860 found 15 which he judged to be the remainder of these. Both Hooker and GADEAU DE KERVILLE, who was there in 1908, measured some of the great trees, the former estimating that the largest might be 2500 years old. But from a specimen in the Kew museum showing 235 annual rings, Hooker's 2 largest trees, with a girth of 13 feet, would be about 2330 years old.—*M. F. Warner.*

865. JACOB, JOSEPH. "Pritzel." "A florist's plea to the powers that be." *Garden* 83: 118-119. 1919.—In regard to extending the scope of the new edition of the "Iconum botanicarum index" which has been undertaken by the Royal Horticultural Society.—*Neil E. Stevens.*

866. JACOB, JOSEPH. *The wheat-ear carnation.* *Garden* 83: 300-301. 1. fig. 1919.—Apropos of a paper on this subject in the *Carnation Year Book* for 1919, author goes back to CASTELLI's "Exactissima descriptio rariorum quarundam plantarum, quae continentur Romae in Horto Farnesiano" (1625), and reproduces the drawing of "Caryophyllus spicatus" from the 11th chapter. He also cites LINNE, "Hortus Cliffortianus" (1737); WEINMANN, "Phytanthozaiconographia" (1739); and *Bot. Mag.* (1814), plate 1622, for illustrations of the same phenomenon.—*M. F. Warner.*

867. JENNINGS, O. E. John Adolph Shafer. *Trillia* 5: 3-7. 1919.—Born 1863, died 1918.—*M. F. Warner.*

868. JUEL, H. O. *Hortus Linnaeanus. An enumeration of the plants cultivated in the Botanical garden of Upsala during the Linnean period.* *Skrifter Svenska Linné Sällsk.* 1: 1-127. 1919.—Linnaeus was in charge of the garden at Upsala from 1742 until at least 1776, when his son may have taken over its care. The present list of 2157 species is compiled from books and papers of father and son, the titles of which are given in chronological order on p. 6-8.—*M. F. Warner.*

869. KELLY, H. A., AND W. L. BURRAGE. *American medical biographies.* xix + 1320 p. Norman, Remington Co.: Baltimore, 1920.—In selecting the more than 1900 names here included the principle of the editors has been "to include every man who has in any way contributed to the advancement of medicine in the United States or in Canada, or who, being a physician, has become illustrious in some other field of general science or in literature." This policy together with the senior editor's special interest in botany and medical botanists makes this a valuable reference book for botanical biography. Biographical sketches are given of the botanists listed below. In some cases this is the only readily available biography of the subject, many of the sketches contain new material, and all are prepared by competent



authors. Numerous citations of literature are given. Timothy Field Allen (1837-1902), Benjamin Smith Barton (1766-1815), William Paul Crillon Barton (1786-1856), John Bartram (1699-1777), Lewis Caleb Beck (1798-1853), Jacob Bigelow (1787-1879), John Shaw Billings (1838-1913), Reed Brockway Bontecou (1824-1907), Charles Miller Booth (1830-1906), John Brickell (1710?-1745), John Brickell (1749-1809), Robert Bridges (1806-1882), Joseph Carson (1808-1876), Jonathan Carver (1710-1780), Alvan Wentworth Chapman (1809-1899), John Clayton (1693-1773), Cadwalader Colden (1688-1776), Alva Curtis (1797-1881), William Darlington (1782-1863), Chester Dewey (1784-1867), Solomon Drowne (1753-1834), John Eberle (1787-1838), James Eighty (1798-1882), Jared Eliot (1685-1763), Gouverneur Emerson (1795-1874), George Engelmann (1809-1884), Abram Paschal Garber (1838-1881), Alexander Garden (1728-1791), Jean Francois Gaultier (1708-1756), Lewis Reeve Gibbes (1810-1894), William Peters Gibbons (1812-1897), Asa Gray (1810-1888), Jacob Green (1790-1841), Traill Green (1813-1897), Robert Eglesfeld Griffith (1798-1850), Seth Hastings (1780-1861), Louis Hebert (died 1627), William S. Herbst (1833-1906), Constantine Hering (1800-1880), John Philip Hiester (1803-1854), Thomas Horsfield (1773-1859), David Hosack (1769-1835), Benjamin Franklin Hough (1822-1885), Elliot C. Howe (1828-1899), John Gibbons Hunt (1826-1893), Eli Ives (1779-1861), Laurence Johnson (1845-1893), Albert Kellogg (1813-1887), Peter D. Knieskern (1798-1871), Adam Kuhn (1741-1817), John Locke (1792-1856), Moses Marshall (1758-1813), James Mease (1771-1846), Joseph Hinson Mellichamp (1829-1903), Ezra Michener (1794-1887), John Mitchell (1680?-1768), Samuel Latham Mitchill (1764-1831), Isaac Shoemaker Moyer (1838-1898), John Strong Newberry (1822-1892), Charles Christopher Parry (1823-1890), William Dandridge Peck (1763-1822), David Lewis Phares (1817-1892), Charles Pickering (1805-1878), Richard Upton Piper (1816-1897), Zina Pitcher (1797-1872), Francis Peyre Porcher (1825-1895), Alyre Raffeneau-Delile (1778-1850), Isaac Rand (1743-1822), George Abraham Rex (1845-1895), John Leonard Riddell (1807-1867), James Watson Robbins (1801-1879), James Henry Salisbury (1823-1905), Michel S. Sarrazin (1659-1734), Henry Parker Sartwell (1792-1867), John Linnaeus Edward Whitridge Shecut (1770-1836), Charles Wilkins Short (1794-1863), George Smith (1804-1882), Peter Smith (1753-1816), Thomas Taylor (1820-1910), James Thacher (1754-1844), A. S. Todd (1798-1883), John Torrey (1796-1873), William Tully (1785-1859), George Vasey (1822-1893), Benjamin Vaughan (1751-1835), John Aston Warder (1813-1833), Charles Abiathar White (1826-1910), Frederick Adolphus Wislizenus (1810-1889), Christopher Witt (1675-1765), Thomas Fanning Wood (1841-1892), William Zollickoffer (1793-1853).—*Neil E. Stevens.*

870. KILLERMANN, S[EBASTIAN]. *Die Herkunft und Einführung unserer Gartenbohne (Phaseolus vulgaris L.).* [The origin and introduction of our garden bean.] *Naturwiss. Wochenschr. N. F.*, 18: 305-312. *Fig. 1-2.* 1919.—An introduction from America, which took an important place in European gardens early in the 16th century. Early literature is cited and discussed.—*B. O. Dodge.*

871. KILLERMANN, S[EBASTIAN]. *Die Herkunft des Kalmus (Acorus calamus L.).* [The origin of sweet flag.] *Naturwiss. Wochenschr. N. F.*, 18: 633-637. *1 fig.* 1919.—Citations and discussion of early references to this plant.—*B. O. Dodge.*

872. KILLERMANN, S[EBASTIAN]. *Zur Geschichte der Ananas und Agave.* [On the history of the pine-apple and agave.] *Naturwiss. Wochenschr. N. F.*, 17: 497-503. *Fig. 1-3.* 1918.—Citations and discussion of early literature on these plants.—*B. O. Dodge.*

873. KILLERMANN, S[EBASTIAN]. *Zur Geschichte der Johannis- und Stachelbeere.* [On the history of the currant and gooseberry.] *Naturwiss. Wochenschr. N. F.*, 18: 344-347. *Fig. 1-2.* 1919.—Records of the currant are found as far back as the fifteenth century, and of the gooseberry as far back as the sixteenth century.—*B. O. Dodge.*

874. KILLERMANN, S[EBASTIAN]. *Zur Geschichte der Kakteen.* [On the history of cacti.] *Naturwiss. Wochenschr. N. F.*, 18: 665-668. 1919.—Numerous early references to cacti are cited and discussed.—*B. O. Dodge.*



875. KRZYMOWSKI, RICHARD. Die agrarhistorischen Theorien Eduard Hahns. [The agricultural history theories of Eduard Hahn.] Landw. Jahrb. 53: 485-499. 1919.—The Hahn theory of the development of agriculture is based on the supposition that the early humans were vegetarians or vegetable collectors and that they divided into hunters and fishermen. The choppers, or woodsmen, came from both the fisherfolk and the vegetable collectors, and from the woodsmen developed the horticulturists and agriculturists. The latest group in this development was the herdsmen, or flock masters, who developed from the agriculturists. The theory is opposed to the common conception that the first peoples were hunters and fishermen, then nomads, and finally agriculturists.—*Lyman Carrier*.

876. LAUFER, BERTHOLD. Sino-Iranica; Chinese contributions to the history of civilization in ancient Iran, with special reference to the history of cultivated plants and products. Field Mus. Nat. Hist. Publ. Anthropol. Ser. 15: iv + 185-630. 1919.—The following are traced in their migration from Persia to China (Sino-Iranica), or from China to Persia (Irano-Sinica): Alfalfa, grape-vine, pistachio, walnut, pomegranate, sesame and flax, coriander, cucumber, chive, onion and shallot, garden pea and broad bean, saffron and turmeric, safflower, jasmine, henna, balsam-poplar, manna, asafoetida, galbanum, oak-galls, indigo, rice, pepper, sugar, myrobalan, the "gold-peach," fu-tse, Brassica, cummin, date-palm, spinach, sugar beet and lettuce, Ricinus, almond, fig, olive, cassia pods and carob, narcissus, balm of Gilead, water-melon, fenugreek, nux-vomica, carrot, aromatics, Malayan Po-se and its products.—*E. H. Groff*.

877. LECOMTE, HENRI. Édouard Bureau. Rev. Gén. Sci. 30: 97-98. 1919.—Professor Bureau (1830-1918) succeeded Tulasne as assistant to Brongniart at the Museum of Natural History (Paris), and was afterward professor of systematic botany in that institution for over 30 years. In addition to his studies on the morphology and taxonomy of flowering plants he was much interested in fossil botany.—*Neil E. Stevens*.

878. LIPMAN, J. G. Byron David Halsted. Proc. Amer. Soc. Hort. Sci. 15: 117. 1919. (From the "Voorhees farmer," October, 1918.)

879. LORTEL, J. La transformation des jardins par la Convention en l'An II. [Transformation of gardens by the Convention in 1794.] Rev. Hort. 90: 109-110. 1 fig. 1918.—Efforts to stimulate food production in war time recall a similar attempt in 1794 to popularize vegetable growing. It was the original intention to use portions of the gardens of the Tuileries and Luxembourg, the Paris Museum of Natural History, and other places, for potato growing only, but the scope of the plan was broadened to include turnips, beets, pumpkins, and the Jerusalem artichoke.—*M. F. Warner*.

880. LOYER, MAURICE. Paul Chappellier (1822-1919). Bull. Soc. Nation. Acclimat. France 66: 329-330. Portrait. 1919.—Obituary notice. Chappellier experimented on improvement of food plants, notably the Chinese yam and *Stachys affinis*.—*Neil E. Stevens*.

881. MAIDEN, J. H. A contribution to a history of the Royal Society of New South Wales, (with information in regard to other New South Wales societies). Jour. and Proc. Roy. Soc. New South Wales 52: 215-361. 1918.—Details in regard to the following: Philosophical Society of Australasia (Dec. 1821-1822?), Agricultural Society of New South Wales (July 5, 1822-Feb. 22, 1826), Agricultural and Horticultural Society of New South Wales (Feb. 22, 1816-1836), Australian Society to Promote the Growth and Consumption of Colonial Produce and Manufactures (1830-1836), Australian Floral and Horticultural Society (1836-1848), Australasian Botanic and Horticultural Society (June 20, 1848-Dec. 8, 1856), Horticultural Improvement Society of New South Wales (Jan. 15, 1855-Dec. 8, 1856), Australian Horticultural and Agricultural Society (Dec. 8, 1856), Australian Philosophical Society (Jan. 19, 1850-July 30, 1855), Philosophical Society of New South Wales (July 30, 1855-Dec. 12, 1866), Royal Society of New South Wales (Dec. 12, 1866 to date). A summary of their proceedings is given, with titles of papers read.—*M. F. Warner*.



882. MARZELL, HEINRICH. Zur Kulturgeschichte des Schellkrautes. [On the history of the culture of celandine.] Naturwiss. Wochenschr. N. F., 18: 601-604. 1919.—The medical uses of *Chelidonium majus* L. in the past are reviewed and early literature is cited.—B. O. Dodge.

883. MÖBIUS, MARTIN. Die Begründung der Pflanzengeographie durch Alexander von Humboldt. [The establishment of plant geography by Alexander von Humboldt.] Naturwiss. Wochenschr. N. F., 18: 521-526. 1 fig. 1919.—An appreciation of the pioneer work of von Humboldt in this field, prepared in celebration of the one hundred fiftieth anniversary of his birth.—B. O. Dodge.

884. MORRIS, DANIEL. Botany and the Empire. Gard. Chron. III, 66: 156, 163-164, 175-176, 187-188, 205, 210-211. 1919.—Presidential address, Botanical Section, British Association for the Advancement of Science. [See Bot. Absts. 7, Entry 72, where author's name is incorrectly given as "J. C." Morris.]—Neil E. Stevens.

885. MURRILL, W. A. The lotus of ancient Egypt. Jour. New York Bot. Gard. 20: 231. 1919.—The plant known in America as "Egyptian lotus" was held sacred in India, China, and Japan, but never used as decorative motive by the ancient Egyptians.—M. F. Warner.

886. NEUMANN, FELIX. Leonhard Fuchs, physician and botanist, 1501-1566. Ann. Rept. Smithsonian Inst. 1917: 635-647. Pl. 1-7. 1919.

887. NUTTALL, ZELIA. The flower lovers and gardeners of ancient Mexico. Jour. Internat. Gard. Club 3: 364-379. Illus. 1919.—Great love of flowers was characteristic of the Mexicans from time immemorial, and a unique and ingenious botanical nomenclature is exhibited in the Nahuatl or Mexican tongue, in which certain words used as prefixes or suffixes to plant names convey information as to their qualities or habitats; this seems to be a legacy from a very old civilization. An episode of the reign of Montezuma is given showing high value placed on rare plants. Horticulturists and florists were of great importance. Sahagun's *Historia general de la Nueva España* is quoted, and drawings of Sahagun reproduced showing gardeners at work in sowing and transplanting, picking flowers and making floral designs. Specimen "flower songs" from the Nahuatl are also given.—M. F. Warner.

888. NUTTALL, ZELIA. The gardens of ancient Mexico. II. Jour. Internat. Gard. Club 3: 572-590. Illus. 1919 [1920].—Quotations are given from a detailed description of a native garden given by Cortés in his second letter to the Emperor Charles V in 1520, and from accounts of the gardens of Montezuma and those of Nezahualcoyotl at Texcoco. Plants observed by Hernandez in the gardens of Huaxtepec between 1570 and 1577 are mentioned. Description of the famous "Chinampas" or floating gardens, which are actually mud beds raised above the surface of the lagoon, on which vegetables and flowers for the markets of the city of Mexico are still grown at the present day, just as they were in the most remote times. There is, however, record of veritable floating gardens in the period about 1350-1400, when the Nahuas or Mexicans were required to deliver annually by way of tribute to the king of Atzcapotzalco, a raft planted with all the native trees and vegetables. [See preceding entry.]—M. F. Warner.

889. PAYNE, C. H. A bibliographical curiosity. Gard. Chron. III, 64: 7-8. 1918.—A work with title in both English and French: "The English flower garden—Le Jardin de fleurs anglais," which is without date, but in which the plates are reprints of those in the very rare "Compleat florist" of 1740.—M. F. Warner.

890. PAYNE, C. H. Captain Bernet. Garden 83: 15. 1919.—Bernet, born 1775, died 1855, was a retired army officer who began to grow seedling chrysanthemums at Toulouse in 1827. Before that time there had been little effort to obtain new varieties; Bernet in the first two years raised nearly 60, and from that time the improvement of the chrysanthemum was undertaken by many growers.—M. F. Warner.

891. PAYNE, C. H. *The chrysanthemum in China*. Gard. Chron. III, 64: 233-234. 1918.—An account by an early Jesuit missionary in 'Mémoires concernant l'histoire, les sciences, les arts, les mœurs, les usages, &c. des Chinois. Par les missionnaires de Pékin. Tome troisième. Paris, 1778.' A very modern discussion of the flower, strangely overlooked by other early writers on the chrysanthemum. The "Kiu-hoa" or "Chü-hwa" of the Chinese is identified with the *Matricaria* of Tournefort and other 17th and 18th century botanists, the *Chrysanthemum indicum* of the Botanical Magazine, and the *Anthemis grandiflora* of Ramatuelle, who was the first to describe it from European-grown seeds in 1792, at least 25 years after the account discussed, as this volume, though published in 1778, is dated at the end: "a Pé-King ce 3 Novembre, 1767."—*M. F. Warner*.

892. P[AYNE], C. H. *Old gardening books*. Gard. Chron. III, 64: 111. 1918.—Apropos of gardening literature, "The Gentleman and Lady's Gardener" of ROBERT EDMEADE (1776) is noted, which is not only a catalogue of seeds and plants for sale by him, but contains cultural directions and a monthly calendar of operations, together with the Latin name of each plant according to the Linnean classification.—*M. F. Warner*.

893. PAYNE, C. H. *Pierre Blancard*. Garden 82: 475-476. 1918.—Blancard was born at Marseilles April 21, 1741, and died there March 16, 1826. On his return from his fifth voyage to the Orient he introduced the chrysanthemum into Europe in 1789; it soon spread throughout Provence, was grown at the Jardin des Plantes in Paris, and is said to have been sent to Kew by CELS. It bloomed for the first time in England at Colvill's nursery in Chelsea, and was first figured in the Botanical Magazine as t. 327.—*M. F. Warner*.

894. PAYNE, C. H. *T'ao-Yüan-Ming*. Garden 82: 444, 455. 1918.—Chinese litterateur and chrysanthemum lover (365-427 A.D.). Little is told of his cultivation of the flower, save that his favorite was the variety known as "Kiu-hwa-chü" or "Nine glories." Extracts from his writings, and allusions to him in works of other Chinese authors, are quoted.—*M. F. Warner*.

895. POLLACCI, GINO. *In ricordo di Giovanni Briosi*. Atti Ist. Bot. Univ. Pavia 17: iii-xvii. *Portrait*. 1920.—Born at Ferrara, April 26, 1846, died at Pavia, July 20, 1919.—Baccalaureate degree in engineering at the University of Ferrara. Studied also at Torino and Naples and went to Belgium and Germany for training in agriculture. Studied with Kraus and deBary. Founded the agricultural experiment station at Palermo in 1873 and gave a strong stimulus to studies in enology and vegetable pathology. In 1877 he was called to the chemico-agricultural station at Rome where he established an experimental vineyard, propagated 500 varieties of grapes and did much enological work. He was called to the chair of botany at the University of Pavia in 1883. Here he first put the botanical garden in order and reorganized the station for cryptogamic botany, of which he was director. He began the publication of "Atti" which now has reached its 250th memoir. Author of many papers on parasitic fungi and fungus diseases of plants. A leader of Italian botanists. A bibliography of 161 titles is appended.—*D. Reddick*.

896. RAVN, F. K. *Experiments in plant culture in Denmark*. Scottish Jour. Agric. 3: 207-214. 1920.—The first experiments by B. S. JØRGENSEN in 1860 were largely modelled on those at Rothamsted. A famous pioneer in work with meadow plants was P. NIELSEN, who in 1886 was made director of the first Danish state experiment station for field work. Toward the last of the 19th century attempts were made to establish local experiments in plant culture. An outline of work at the present time is given under the following heads: I. The state experimental work in plant industry; II. Experiments conducted by the agricultural societies; III. Plant breeding in its relation to experimental work. [See also Bot. Absts. 8, Entry 69.]—*M. F. Warner*.

897. REDDICK, DONALD. *Vern Bonham Stewart*. Phytopath. 9: 111-113. *Portrait*. 1919.—A sketch of the life of V. B. Stewart (1888-1918) with a list of his botanical publications.—*Neil E. Stevens*.



898. R[ENDLE], A. B. [Anne Casimir Pyramus de Candolle.] Jour. Botany 57: 23-24. 1919.—His death on Oct. 3, 1918, "is for the systematic botanist the breaking of a link with the past." The son of Alphonse and grandson of Augustin Pyramus de Candolle, his botanical contributions had not the fundamental character of some of theirs, but he did useful work.—*Neil E. Stevens.*

899. RICHMOND, C. W. In memoriam—Edgar Alexander Mearns, 1856-1916. Ann. Rept. Smithsonian Inst. 1917: 649-662. *Portrait.* [1919].—Dr. Mearns collected plants extensively in various regions while on duty as surgeon in the U. S. A. and was naturalist on the Roosevelt expedition to Africa.—*Neil E. Stevens.*

900. ROBERTS, W. Brunton, of Birmingham. Gard. Chron. III, 64: 142. 1918.—The recently published "Catalogue of the Birmingham collection" of the Birmingham public library, includes the "Catalogue of plants, botanically arranged according to the system of Linnaeus" of John Brunton & Co., 83 High Street, Birmingham, 1777; also one of forest and fruit trees issued by Brunton & Forbes in 1782, and another catalogue of trees in 1787, when the firm was Brunton, Forbes & Hunter.—*M. F. Warner.*

901. ROBERTS, W. An eighteenth-century London seedsman. Gard. Chron. III, 63: 223. 1918.—"A Catalogue of several sorts of grass seeds, sold by Nathaniel Powell, at the King's Head, near Fetter Lane end, in Holborn, London," is a series of cultural directions, followed by "A Short account of the improvement of land by several sorts of seeds," by the same person, and, though without date, the format and typography place them in the early years of the 18th century. POWELL's name as seedsman at 39, Holborn, appeared in the London directories until 1771, and it is possible that he may have been the Nathaniel Powell whose death is recorded in the Gentleman's Magazine as taking place at Bristol on March 1, 1773. His catalogue deals almost exclusively with trefoil, clover, sainfoin, ryegrass, and lucerne, and Powell presents their advantages in a manner which suggests thorough observation and practical experience.—*M. F. Warner.*

902. [ROBERTS, W.] Florists' feasts; a 16th century custom; as old as gillyflowers and carnations. The Times [London] No. 43134 (June 24). 16. 1919.—Custom probably introduced to England by Flemish cloth manufacturers settling in 1597 at Norwich, and certainly flourishing as early as 1631, when RALPH KNEVET wrote a play, "Rhodion and Iris," for presentation at the Norwich florists' feast. Nearly all the exhibitions of flowers and fruits of the 18th and early 19th century were held at public houses, where an inexpensive "ordinary" was provided. Flowers, fruits, and vegetables of all sorts (tulips, carnations, auriculas, melons, gooseberries, and cabbages) were the subjects of competition, but with the institution in the 19th century of the Royal Horticultural Society and those of the various counties, these florists' feasts, having served their purpose in the encouragement of horticulture, disappeared.—*M. F. Warner.*

903. [ROBERTS, W.] Old gardening literature. The Times [London] Lit. Suppl. No. 872 (Oct. 3) 472. 1918.—Rare books on agriculture, gardening, and botany, sold during the past season, with note of some of the libraries rich in such literature.—*Neil E. Stevens.*

904. ROBERTS, W. Tulip Paul Diack. Gard. Chron. III, 64: 201. 1918.—In the second of his satires, "Love of Fame, the universal passion," the Rev. EDWARD YOUNG (best known as author of the "Night thoughts") deals poetically with this flower, and in his key says that "Paul Diack, who gave name to a tulip, was an honest, topping old citizen of London." The name is possibly of Dutch or Flemish origin, and may have been Dyck.—*M. F. Warner.*

905. ROBERTS, W. A Whitechapel botanical garden. Gard. Chron. III, 64: 245-246. Fig. 98-99. 1918.—The garden of WILLIAM BENNETT, "Cornfactor and Biscuit Baker," situated in Whitechapel Fields, next the half-way house to Stepney, only known from the auction catalogue of its contents, to be sold 27th March, 1766. A list of the botanical names

in this catalog is given, showing that several of these plants were grown by Bennett previous to the dates recorded for their introduction into Great Britain, as for instance *Selago spuria*, supposed to have been introduced in 1779, and *Pisonia aculeata* and *Ruellia ciliata*, in 1806. Although there is no other intimation of the fact, the large number of certain plants, e. g., 350 pineapples, suggests that Bennett may have traded in plants.—*M. F. Warner*.

906. SCHIPS, M. *Lionardo da Vinci als Naturforscher*. [Leonardo da Vinci as a naturalist.] *Naturwiss. Wochenschr. N. F.*, 18: 256-259. 1919.

907. SCHRAMM, J. R. *Botanical Abstracts*. *Science* 49: 195-196. 1919.—An account of the organization of the Board of Control and the plans for this journal.—*Neil E. Stevens*.

908. SHEAR, C. L., and N. E. STEVENS. *Plant pathology to-day*. *Sci. Monthly* 7: 235-243. 1918.—The development of plant pathology, especially in America, is discussed and some of the significant papers are cited.—*B. O. Dodge*.

909. SIMMONS, J. R. *The historic trees of Massachusetts*. 8 vo., xxi + 139 p. *Illus.* Marshall Jones Company: Boston, 1919.

910. SINGLETON, ESTHER. *The Shakespeare garden*. *Jour. Internat. Garden Club* 3: 545-556. *Illus.* 1919 [1920].—Evolution of the garden of delight; plants proper to the English garden in ALEXANDER NECKAN'S "De naturis rerum" (12th century), and those enumerated by JOHN DE GARLANDE and by GUILLAUME DE LORRIS in his "Roman de la Rose" in the 13th century; the formal garden, symbolism of gardens, and development of garden in Tudor times, are discussed, with many extracts from late 16th century literature.—*M. F. Warner*.

911. SPINDEN, H. J. *Origin of American agriculture; ancient pottery reveals the invention and spread of agriculture in America*. *Sci. Amer. Suppl.* 88: 120-121, 127. *Illus.* 1919.—"The most reliable information regarding the agriculture of the past lies in the pottery which was inseparably associated with it." Earliest records of cultivated plants are found in Mesopotamia, Egypt, Mexico, and Peru. Illustrations are from pottery in form of ears of maize (Mexican and Peruvian), and squashes (Peruvian).—*M. F. Warner*.

912. STEVENS, N. E. *American botany and the great war*. *Science* 48: 177-179. 1918.—Several incidental effects of the war on botanical work are mentioned, but the organization of phytopathologists for emergency work is given most attention.—*B. O. Dodge*.

913. SYDOW, HANS. *Ferdinand Theissen, S. J.* *Ann Mycol.* 17: 134-139. 1919 [1920].—An appreciation, with brief biography, of Ferdinand Thiessen (1877-1919). A bibliography of his 52 mycological contributions is appended. [See also *Bot. Absts.* 7, Entry 71.]—*H. S. Jackson*.

914. TONI, G. B. DE. *Fabio Colonna e l'eterocarpia*. *Riv. Biol.* 1: 46-49. 1919.—Colonna's observations on heterocarp. Many examples of this phenomenon are afforded by *Calendula*, and FUCHS in his "De historia stirpium commentarii" (1542) shows a figure of *C. officinalis* with akenes arranged in a semi-circle, but does not recognize the polymorphic nature of the fruit. Just 50 years later Fabio Colonna (1567-1640), in his first book, "Phytobasanos sive Plantarum aliquot historia" (1592) p. 52-59, describes and figures the plant called *Clymenon Dioscoridis*, now referred to *Calendula officinalis*, which he says is characterized by 3 different forms of fruits. This peculiarity of *C. officinalis* was later figured by ELIZABETH BLACKWELL in her "Curious herbal" (1739), by GAERTNER, "De fructibus et seminibus plantarum" (1788), and by POIRET in "Encyclopédie méthodique," *Suppl.* 5: 188. Tab. 715.—*M. F. Warner*.

915. TRUE, R. H. *Notes on the early history of the pecan in America*. *Ann. Rept. Smithsonian Inst.* 1917: 435-448. [1919].—A series of notes from unpublished or inaccessible sources, dealing with the discovery, introduction into Europe, botanical description, early cultivation, and improvement of the pecan.—*Neil E. Stevens*.



916. VAUPEL, FRIEDRICH. **Karl Schmidt.** *Monatsschr. Kakteenk.* 29: 73-74. 1 fig. 1919.—Karl Schmidt of the firm of Haage & Schmidt was born Dec. 23, 1848, and died Feb. 26, 1919, at Erfurt.—*A. S. Hitchcock.*

917. VIOLA, BARTHOLOMEW. **The history of sugar.** *Louisiana Planter and Sugar Manufacturer* 65: 379-381, 398-399. 5 fig. 1920.—A history of sugar and of sugar manufacture from very early times. The sugar cane industry is also traced from country to country.—*C. W. Edgerton.*

918. WARNER, M. F. **Bibliographical opportunities in horticulture.** *Bull. Amer. Library Assoc.* 13: 178-184. 1919.—The following are suggested as important and interesting lines of work in this field: Continuation of the check list of American horticultural books; the preparation of much needed indexes of horticultural periodicals; the collection of data on early American journals and societies; critical bibliographical work; and biographical and historical research.—*Neil E. Stevens.*

919. WARNER, M. F. **Date of Robert Thompson's birth.** *Gard. Chron.* III, 64: 116-117. 1918.—Mr. BUNYARD's sketch, March 23, 1918, quotes Thompson's own statement from the Chiswick records, that he was born in 1799, which would seem to be conclusive. But sketches in *Journal of Horticulture* in 1869 and 1877, while admitting that there is no birth register by which the precise date can be fixed, infer that it was in September, 1798, from the fact that his baptism occurred on the 16th of October of that year.—*M. F. Warner.*

920. WARNER, M. F. **Horticultural libraries in the United States.** *Gard. Chron.* III, 65: 247. 1919.—The collection of the Library of the U. S. Department of Agriculture in its relation to horticulture, with some comment on its administration and relation to other libraries.—*Neil E. Stevens.*

921. WHITE, O. E. **Our common garden vegetables; their history and their origin.** *Brooklyn Bot. Gard. Leaflet* VI, 3: 1-19. Fig. 1-5. 1918.—Popular account with list of common edible plants, their place of origin, and probable antiquity of cultivation.—*Neil E. Stevens.*

922. WICKSON, E. J. **Beginnings of agricultural education and research in California.** *Rept. California Agric. Exp. Sta.* 1917/18: 35-101. 1918.—Discusses the following: Plant introduction and distribution (p. 67-69); grasses and forage plants (p. 69-72), cereals (p. 72-74), forestry (p. 74-77), viticulture (p. 77-79), horticulture (p. 79-83), plant diseases (p. 86-88).—*Neil E. Stevens.*

923. WILDEMAN, ÉMILE DE. **Alfred Cogniaux (1841-1916).** *Bull. Jard. Bot. Bruxelles* 5: i-xxx. *Portrait.* 1919.—Account of life and botanical work of Cogniaux, who in later years devoted himself to the Cucurbitaceae, Melastomaceae, and Orchidaceae. A list of his works, in chronological order from 1863 to 1916, comprises over 150 titles.—*Neil E. Stevens.*

## BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

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(See also in this issue Entries 939, 1049, 1079, 1084, 1115)

924. ANONYMOUS. [Rev. of: DYMES, T. A. **The nature study of plants in theory and practice for the hobby-botanist.** xviii + 173 p., 54 fig. Society for Promoting Christian Knowledge: London, 1920.] *Sci. Prog.* [London] 15: 320. 1920.

925. ANONYMOUS. [Rev. of: DYMES, THOMAS ALFRED (Introduction by F. E. WEISS). **The nature study of plants in theory and practice for the hobby-botanist.** xviii + 173 p., 54 fig. Society for Promoting Christian Knowledge: London, 1920.] *Jour. Botany* 58: 277-278. 1920.

926. COOK, MEL. T. *College botany*. 392 p. J. B. Lippincott & Co.: Philadelphia, 1920.

927. DICKSON, B. T. Do our agricultural colleges educate? *Sci. Agric.* 1:12-13. 1921.—This article is a plea for rational education and the consequent diminution of the importance of the final examination. The fundamental question is whether students are trained to think. The suggestion is made that the "*seminar*" method be used more, even in undergraduate courses, and that final examinations be replaced by unannounced tests during term, combined with carefully checked laboratory work.—*B. T. Dickson*.

928. HOLMBOE, JENS. Den botaniske afdeling. [The botanical section.] Bergens Mus. Aarsberetning 1917-1918: 36-44. 1918.—Annual report of development of herbarium, botanical garden, conservatory, and botanical laboratory.—*A. Gundersen*.

929. HOLMBOE, JENS. Den botaniske afdeling. [The botanical section.] Bergens Mus. Aarsberetning 1918-1919: 37-45. 1919.—Annual report.—*A. Gundersen*.

930. JONES, W. NEILSON, AND M. C. RAYNER. A text book of plant biology. viii + 262 p., 6 pl., 36 fig. Methuen & Co., Ltd.: London, 1920.

## CYTOLOGY

GILBERT M. SMITH, *Editor*

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(See in this issue Entries 1096, 1103, 1119, 1205, 1237, 1574)

## ECOLOGY AND PLANT GEOGRAPHY

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(See also in this issue Entries 791, 809, 812, 883, 1000, 1032, 1033, 1043, 1224, 1227, 1235, 1236, 1238, 1239, 1240, 1251, 1252, 1254, 1256, 1257, 1259, 1261, 1265, 1266, 1267, 1316, 1364, 1466, 1489, 1532, 1549, 1551, 1560)

## GENERAL, FACTORS, MEASUREMENTS

931. DARWIN, F. A phaenological study. *New Phytol.* 18: 287-298. 1919.—A record is given of the flowering dates of 259 of the commoner plants near Brookthorpe, Gloucestershire, England, for the years 1917, 1918, and 1919. Tables are also given of the mean weekly temperatures and of the deviations from the normal.—*I. F. Lewis*.

932. FRITSCH, F. E. Algal ecology. Freshwater and terrestrial forms. *Jour. Ecol.* 8: 68-76. 1920.—A review of recent contributions to the ecology of freshwater algae. Among the notable papers are those by MACCAUGHEY on Hawaiian forms (see Bot. Absts. 1, Entry 200), by TRANSEAU on *Spirogyra* hybrids (see Bot. Absts. 2, Entry 715), by ELMORE on the diatoms of Devil's Lake (see Bot. Absts. 2, Entry 10), and by CHODAT on some alpine species. Among the forms noted are *Oscillatoria*, *Coelastrum*, *Volvox*, *Euglena*, and *Hormidium*.—*Geo. D. Fuller*.

933. FRITSCH, F. E. Algal ecology. Marine forms. *Jour. Ecol.* 8: 66-68. 1920.—In a review of some of the recent contributions to the ecology of marine algae the principal points relate to the distribution of the Laminariaceae on the Pacific coast of North America and about the Orkney Islands. Some data by SAUVAGEAU (see Bot. Absts. 1, Entry 1585) on the distribution and naturalization of forms occurring in the southern portion of the Bay of Biscay are noted as well as an ecological discussion of the marine species of the Hawaiian Archipelago by MACCAUGHEY (see Bot. Absts. 1, Entry 200).—*Geo. D. Fuller*.



934. FULLER, GEORGE D. Vegetation of a glacial plunge basin. [Rev. of: PETRY, LOREN C. Studies of the vegetation of New York State. II. The vegetation of a glacial plunge basin and its relation to temperature. Bull. Torrey Bot. Club 45: 203-210. 1918 (see Bot. Absts. 1, Entry 835).] Bot. Gaz. 67: 184. 1919.

935. GAIN, EDMOND, ET ANDRE GAIN. Différences thermique de l'ubac à l'adret d'une vallée lacustre. [Temperature differences between the shaded slope and the sunny slope of a lacustrine valley.] Compt. Rend. Acad. Sci. Paris 170: 191-194. 1920.—The water of the lake is found at times to have a temperature at its surface of 4-6°C. higher than the soil on the adjacent slopes. The temperature of the soil at 1 dm. beneath the surface on the northern sunny slope is usually about 1°C. higher than that of the southern shaded slope. A like difference is found in the water of the streams entering the lake from the two slopes respectively.—C. H. and W. K. Farr.

936. GRAY, JOHN, AND GEORGE J. PEIRCE. The influence of light upon the action of stomata and its relation to the transpiration of certain grains. Amer. Jour. Bot. 6: 131-155. 18 fig. 1919.—See Bot. Absts. 3, Entry 436.

937. JOHNSTON, EARL S. Climatic conditions in a greenhouse as measured by plant growth. [The author's abstract of a paper read before the American Meteorological Society, April 22, 1920.] Monthly Weather Rev. 48: 215. 1920.

938. KEEN, B. A. Forecasting frosts. Nature 104: 450-451. 1920.—Review of observations by BOUSSINGAULT, HELLMAN, SCHUBERT, J. WARREN SMITH, HAZEN, O'GARA, and T. B. FRANKLIN. "Up to the present no complete correlation has been made of frost in any particular locality and its causes. For this purpose an examination by statistical methods of a series of continuous observations (of the automatic recording type) of meteorological factors is needed."—O. A. Stevens.

939. MICHAEL, ELLIS L. Marine ecology and the coefficient of association: a plea in behalf of quantitative biology. Jour. Ecol. 8: 54-59. 1920.—The writer examines the various formulae used for deriving the coefficients of association as applied to plankton studies and finds them all deficient. Emphasizing the importance of quantitative results he demands that proficiency in mathematics be regarded as a prerequisite for major work in biology.—Geo. D. Fuller.

940. SHULL, CHARLES A. Correlation of wind flow and temperature with evaporation. Plant World 22: 210-215. Fig. 1919.—Statistical study of the data obtained from evaporation station records from Lawrence, Kansas, shows that the correlation between air movement and evaporation is  $0.29 \pm 0.027$ , and between temperature and evaporation the correlation is  $0.687 \pm 0.0156$ .—Charles A. Shull.

## STRUCTURE AND BEHAVIOR

941. CROCKER, WILLIAM. Buried weed seeds. [Rev. of: BRENCHLEY, WINIFRED E. Buried weed seeds. Jour. Agric. Sci. 9: 1-31. 1918 (see Bot. Absts. 2, Entry 615).] Bot. Gaz. 67: 515-516. 1919.—The reviewer regards the author's conclusions justified, but records her failure to note the very similar studies and conclusions of PETER, BEAL, and DUVEL.—H. C. Cowles.

942. CROCKER, WILLIAM. Osmotic pressure of epiphytes. [Rev. of: HARRIS, J. ARTHUR. On the osmotic concentration of the tissue fluids of phanerogamic epiphytes. Amer. Jour. Bot. 5: 490-506. 1918 (see Bot. Absts. 1, Entry 829; 8, Entry 944).] Bot. Gaz. 67: 520. 1919.

943. DOUGLASS, A. E. Climatic cycles and tree growth: a study of the annual rings of trees in relation to climate and solar activity. Carnegie Inst. Washington Publ. 289. 127 p., pl. 1-12, fig. 1-40. 1919.—Measurements and dates of formation of the annual rings of 230

trees, some over 2000 years old, were used as a basis for the study. Yellow pine (*Pinus ponderosa*) from Arizona and sequoia (*Sequoia gigantea*) from the Californian high Sierras furnished most of the specimens, although a considerable collection of chiefly Scotch pine (*Pinus silvestris*) with some spruce (*Picea excelsa*) was made in the Baltic drainage district of northern Europe, a smaller collection of hemlock (*Tsuga canadensis*) in Vermont, and another of Douglas fir (*Pseudotsuga mucronata*) in Oregon. Variations in the annual rings of individual trees, which in many cases were a number of miles apart, were often so uniform and characteristic that they permitted ready cross-identification. The fluctuations in growth reflected the sun-spot cycle or its multiples and the correlation with rainfall and temperature was shown to be close over the entire range of existing meteorological data. The correspondence of maxima and minima of these climatic variables with those of sun-spots indicates a physical connection between solar activity and terrestrial weather. Although the study of cycles is not considered complete the following conspicuous periods seem to be evident in the rates of growth: A half, a full, a double, a triple, and a triple triple sun-spot period—the sun-spot period being 10–13 years. Although these frequencies of maxima and minima in the growth curves are common to all the trees, the positions are sometimes regularly displaced, as, for example, in the Vermont trees in which the maximum growth regularly antedated the sun-spot maximum by about 3 years. In addition, the curves of tree growth exhibit a complex combination of short periods, including a prominent cycle of about 2 years; other persistent cycles recur in periods of 19, 14, 10, and 7 years. It was found that the trees' year begins in autumn and that double rings are indicative of spring drought. In dry climates the thickness of a ring is proportional to the rainfall with an accuracy of 70 per cent and a still closer correspondence may be expressed by an empirical formula that takes into account the distribution of the effect of rain over several adjoining years. For the discussion of curve-smoothing, identification of rings, dating of rings, curve standardization for the decreasing rate of growth with increasing age of trees, and the methods of tree selection the original must be consulted. An instrument (the automatic optical periodograph) was devised to reduce the influence of individual judgment in the determination of periodic changes in the growth rate. With it data may be examined for periodicity of any frequency and decisive conclusions drawn concerning changes in periods, recurrence of periods, and constancy of period length. Its description and directions for use cannot be abstracted.—*H. E. Pulling.*

944. FULLER, GEORGE D. Sap concentration in epiphytes. [Rev. of: (1) HARRIS, J. ARTHUR. On the osmotic concentration of the tissue fluids of desert Lorantheae. Mem. Torrey Bot. Club 17: 307–315. 1918 (see Bot. Absts. 1, Entry 684, 828). (2) HARRIS, J. ARTHUR. On the osmotic concentration of the tissue fluids of phanerogamic epiphytes. Amer. Jour. Bot. 5: 490–506. 1918 (see Bot. Absts. 1, Entry 829; 8, Entry 942).] Bot. Gaz. 67: 374–375. 1919.

945. GARDNER, MAX W. The mode of dissemination of fungus and bacterial diseases of plants. Rept. Michigan Acad. Sci. 20: 357–423. 1918.—See Bot. Absts. 3, Entry 764.

946. JONES, FRANK MORTON. Another pitcher-plant insect (Diptera, Sciarinae). Entomol. News 31: 91–94. 1920.—Description of a new fly, to which attention was first called in 1909 by MACFARLANE. Other flies found in pitchers of different species of *Sarracenia* are mentioned.—*O. A. Stevens.*

947. MILLER, DAVID. A new fungus-gnat which fertilizes *Corysanthes oblonga* Hook. New Zealand Jour. Sci. and Tech. 1: 4. 1918.—The gnat is *Erechia thomsoni*.—*H. C. Cowles.*

948. UPHOF, J. C. TH. Cold-resistance as an ecological factor in the geographical distribution of cacti. Jour. Ecol. 8: 41–53. Pl., 6 fig. 1920.—From observations in the desert regions of Arizona and from experiments in the laboratory the conclusion is reached that the protoplasm of different species offers different degrees of resistance to low temperature and that this resistance is a hereditary physiological characteristic of the species. The temperature which damages a plant will kill it if continued long enough.—Some species have a rela-



tively thick integument which is somewhat resistant to low temperatures of short duration such as are common in the Arizona and adjacent deserts. A large range of resistance was found in different species.—*Geo. D. Fuller.*

949. WYLIE, R. B. Trimorphism of *Pontederia*. [Rev. of: HAZEN, TRACY E. The trimorphism and insect visitors of *Pontederia*. Mem. Torrey Bot. Club 17: 459-484. 1918 (see Bot. Absts. 1, Entry 830).] Bot. Gaz. 67: 271-272. 1919.

## VEGETATION

950. FULLER, GEORGE D. Distribution of *Pinus Banksiana* and *Thuja occidentalis*. [Rev. of: FERNALD, M. L. Lithological factors limiting the ranges of *Pinus Banksiana* and *Thuja occidentalis*. Rhodora 21: 41-67. 1919 (see Bot. Absts. 4, Entry 283).] Bot. Gaz. 68: 149-150. 1919.—The reviewer feels that the author has criticized somewhat too severely HUTCHINSON's theory as to the cause of the distribution of these two trees (see Bot. Absts. 4, Entry 190). It is felt that there is truth in both theories, and that they are not necessarily nharmonious with one another.—*H. C. Cowles.*

951. FULLER, GEORGE D. Vegetation of Cape Breton. [Rev. of: NICHOLS, GEORGE E. The vegetation of northern Cape Breton Island, Nova Scotia. Trans. Connecticut Acad. Arts and Sci. 22: 249-467. 70 fig. 1918 (see Bot. Absts. 1, Entry 833).] Bot. Gaz. 67: 370-373. 1919.—“In its comprehensive character, its abundance of detail, and its notable contributions to various phases of ecology, including the relationships between deciduous and coniferous forests, the ecology of the sphagnum and of the development of raised bogs, this report stands as one of the most notable of recent years.”—*H. C. Cowles.*

952. FULLER, GEORGE D. Heath and grassland. [Rev. of: FARROW, E. P. On the ecology of the vegetation of Breckland. III. General effects of rabbits on the vegetation. IV. Experiments mainly relating to the available water supply. V. Observations relating to competition between plants. VI. Characteristic bare areas and sand hummocks. Jour. Ecol. 5: 1-18, 104-112, 155-172. 1917; 6: 144-152. 1918 (see Bot. Absts. 1, Entry 824).] Bot. Gaz. 67: 181-182. 1919.

953. HAUMAN, LUCIEN. La végétation des hautes Cordilleres de Mendoza (République Argentine). [The vegetation of the high Cordilleras of Mendoza.] An. Soc. Cien. Argentina 86: 121-188, 225-348. 21 pl., 7 fig. 1918.—This article gives a rather detailed description of a scanty alpine vegetation found on the high Andes between 31 and 37°S. latitude at elevations from 2000 to 4200 meters. This region possesses many peaks exceeding 6000 m., the highest and best known being Aconcagua with an altitude of 7020 m. These are snow capped and possess a good development of glaciers, from which flow tortuous and variable streams. These furnish almost the entire water supply for the sparse vegetation as the growing season in these mountains is almost entirely without rain. The temperature records are imperfect but an important factor is seen in the light frosts which are common throughout the growing season. One station at 2700 m. gives an annual mean temperature of 6.5°C., with mean maximum of 13.4°C., and a mean minimum of 0.1°C. Humidity is at all times low while wind velocity is decidedly high and constant. Precipitation as recorded at 2000 m. seems to be irregular and variable, the annual amounts ranging from 20 to 69 cm., occurring principally in the colder months in the form of snow. This deficiency of rainfall combined with other factors makes the vegetation not only very scanty but limited to valleys and slopes which possess streams or seepage water from the glaciers and snowfields. In the absence of mountain lakes aquatic vegetation is scanty and anything like mountain meadows are limited to the stream edges and small alluvial fans. Such grassy associations appear to closely resemble similar alpine areas elsewhere. Related to the alpine meadows are the “high Andean oases” formed at 3200-3600 m. where at the foot of talus or morainal slopes some alluvial soil has accumulated. These oases vary in size but rarely reach 100 m. in diameter. They are often dominated by the

juncaceous *Andesia bisexualis* 15 to 30 cm. high forming a thick carpet.—Trees are absent throughout, and even in the valleys the shrubs do not exceed 2 m. in height. *Adesmia pini-foia*, a legume, is the most plentiful shrub, while among the others are *Ephedra americana andina*, *Berberis empetrifolia*, and *Senecio uspallatensis*. *Opuntia andicola*, the only cactus of the region, together with *Azorella Gilliesii* and *Laretia acaulis*, 2 umbellifers, form a curious trio of herbaceous cushion plants confined to the valleys.—Upon the more exposed parts of the mountains there is a notable abundance of prostrate, tufted, rosette and cushion plants often with a striking development of large woody roots. These growth-forms are accounted for as being in response to exposure to high winds and dependence upon a subterranean water supply. Upon the slopes *Adesmia trijuga*, with shrubby cushions 30 cm. high, together with *Poa chilensis* and *Stipa speciosa* in tufts, dominate the area, forming scattered dots over the rocky landscape. Most abundant upon the summits between 3000 and 4000 m. are the subterranean woody cushions of *Adesmia subterranea*, whose leaves form a carpet upon the surface. Accompanying this species with similar growth-forms are the more uncommon *Verbena uniflora* and *Oxalis bryoides*.—The entire vascular flora consists of 417 species, including 1 pteridophyte, *Cystopteris fragilis*, and one gymnosperm, *Ephedra*. Among the best represented families are Compositae with 85 species, Leguminosae with 36, Gramineae with 34, Cruciferae with 28, Portulacaceae with 15, Umbelliferae with 15, Rosaceae with 12, Cyperaceae with 12, Oxalidaceae with 10, and Violaceae and Caryophyllaceae with 9 species each. Well represented genera are *Senecio* with 26 species, *Adesmia* with 16, *Calandrinia* with 15, *Astragalus* with 12, *Oxalis* with 10, and *Viola* with 9. The scarcity of the Saxifragaceae, with 2 rare species, and the entire absence of the Ericaceae and Primulaceae, are worthy of note. Lichens, abundant at the lower altitudes, become very rare above 2800 m., mosses are common about springs up to 3600 m. but liverworts are entirely lacking. More than one-half the species (210) are classed as belonging to the central Andes, 60 being endemic. There are no endemic genera but notable among this group are such aggregates as 6 species of *Adesmia*, 2 of *Boopis*, 12 of *Senecio*, and 2 new varieties of *Koeleria*. The other elements are the northern tropical with 16 species, the subtropical with 21 species, the basal Argentinian with 56 species, the southern Andean with 10 species, the Patagonian with 73 species, and the cosmopolitan and introduced species numbering respectively 28 and 17. This introduced element must be regarded as small when it is recalled that the Mendoza River valley has been the trans-Andean route for centuries.—There is a carefully and fully annotated list of the vascular flora of the regions based on the collections of the author and those of other explorers, and finally there is a bibliography of 54 titles.—Photographs and drawings illustrate many of the less known species.—*Geo. D. Fuller*.

954. RÜBEL, EDUARD. Über die Entwicklung der Gesellschaftsmorphologie. [The evolution of the morphology of plant communities.] Jour. Ecol. 8: 18–40. 1920. The author gives an outline of the history of statistical investigations of vegetation from Humboldt (1807) to the present, tracing an evolution in the study of the forms of plant communities, and treating the work of nearly 30 different workers in some 24 pages.—In different plant communities quantitative results have been sought for such matters as abundance, dominance and its sub-classes, manner of occurrence (gregarious, solitary, etc.), frequency, life-forms (growth-forms) and layers, specificity of species to associations (“Gesellschaftstreue”). The aim is the quantitative expression of relations obtaining in such communities for the investigation of associations and succession and for the purposes of plant geography. The varying forms of associations are well characterized by these results. There is no finality in any method or combinations of methods. The future will undoubtedly show greater advances. The author emphasizes the need for the study of forms in distinction from their ecology. He states that hitherto the work has been too largely concerned with the ecology of plant communities and that it should be more concerned with the morphology of plant communities in order that the results obtained may be applied in the elucidation of successions.—The paper brings into view, in its sketch of the evolution of statistical methods for over a century of activity, that the quantitative results so far reached are sometimes really quantitative only in the sense of being numerical description.—*H. de Forest*.



955. SALISBURY, E. J. A draft scheme for the representation of British vegetation in black and white. Jour. Ecol. 8: 60-61. Pl. 1920.—The various types of vegetation are represented by rather simple symbols.—Geo. D. Fuller.

956. SHREVE, FORREST. Vegetation of Washington and Idaho. [Rev. of: WEAVER, J. E. A study of the vegetation of Southeastern Washington and adjacent Idaho. Univ. Nebraska Studies 17: 1-114. 48 fig. 1917.] Plant World 22: 216-217. 1919.

### FLORISTICS

957. ANDERSON, J. P. Plants of southeastern Alaska. Proc. Iowa Acad. Sci. 25: 427-449. 1920.—A catalogue of pteridophytes and spermatophytes collected mostly at Sitka and Juneau. Habitat and abundance are noted.—H. S. Conard.

958. ANDREWS, A. LEROY. Bryological notes. V. *Scapania nimbosa* from Norway. Torreyia 19: 49-51. 1919.—See Bot. Absts. 3, Entry 699.

959. ANONYMOUS. Geography of U. S. botanical drugs. Pharm. Era 52: 63-66, 89-92. 9 fig., 2 maps. 1919.—See Bot. Absts. 3, Entry 424.

960. ARBER, AGNES. Aquatic angiosperms: the significance of their systematic distribution. Jour. Botany 57: 83-86. 1919.—See Bot. Absts. 3, Entry 733.

961. CLUTE, WILLARD N. Rarity of *Conopholis*. Amer. Bot. 25: 108. 1919.—*Conopholis americana* is regarded as very rare in most of its range. At Saeger's Lake, Valparaiso, Indiana, several acres thickly strewn with this plant were noted in 1919.—W. N. Clute.

962. DEANE, WALTER. *Amsinckia* in New England. Rhodora 21: 38-40. 1919.—An account of the occurrence of the genus in New England.—James P. Poole.

963. FULLER, GEORGE D. Vegetation of Newfoundland. [Rev. of: FERNALD, M. L. The contrast in the floras of eastern and western Newfoundland. Amer. Jour. Bot. 5: 237-247. 3 pl. 1918 (see Bot. Absts. 1, Entry 469).] Bot. Gaz. 67: 101. 1919.

964. GERSTLAUER, L. Neue Arten und Standorte der Flora von Augsburg und Mittelschwaben. [Species and stations new to the flora of Augsburg and Middle Swabia.] Ber. Naturw. Verein. Schwaben u. Neuburg 42: 251-263. 1919.—This article is a continuation of earlier articles published in the same transactions. The author lists 10 pteridophytes and 161 spermatophytes from the region indicated, giving in each case one or more definite stations with the names of the collectors. Eighteen species and 14 hybrids are reported for the first time. At the close of the paper, certain records in Weinhart and Lutzenberger's "Flora von Augsburg" are corrected.—A. W. Evans.

965. GLEASON, H. A. *Rhamnus dahurica* in Michigan. Torreyia 19: 141-142. 1919.—Two wild trees of this species have been found in a swamp south of Ann Arbor, Michigan, 500 yards or more from any residence. Only 1 cultivated tree of the species is known in the vicinity, and as it is smaller it cannot be the parent of the wild trees.—J. C. Nelson.

966. HARPER, ROLAND M. *Tumion taxifolium* in Georgia. Torreyia 19: 119-122. 1919.—*Tumion taxifolium* (Arn.) Greene, the "savin" or "stinking cedar," which has heretofore been known as occurring only in Gadsden and Liberty counties, Florida, was collected by the author in Decatur County, Georgia, on August 16, 1918, in a ravine about 100 yards north of the State line at Chattahoochee, Florida. Several trees were found, some a foot in diameter and 40 feet tall.—J. C. Nelson.

967. KIDDER, NATHANIEL T. *Solidago lepida*, var. *fallax* in Knox County, Maine. Rhodora 22: 77-78. 1920.—An account of the discovery of *Solidago lepida* DC. var. *fallax* Fernald on Nathan's Island, one of the outermost islands of Penobscot Bay, lying about 15 miles

southwest of Mt. Desert. The determination was made at the Gray Herbarium by Professor Fernald. The range of this variety as previously published has been Newfoundland to British Columbia, south to northern New Brunswick, northern Maine, northern Michigan, Utah, and Washington. This new station is the first south of Aroostook Valley.—*James P. Poole.*

968. KNOWLTON, C. H., W. S. RIPLEY, JR., AND C. A. WEATHERBY. Second report of the Committee on Floral Areas. *Rhodora* 22: 80–89. 1920.—This report covers the Polypodiaceae, Schizaceae, and Osmundaceae and is published as a part of the "Preliminary Lists of New England Plants." In addition to giving the distribution of the plants by states, the article gives considerable information as to their distribution according to ecological and soil classifications.—*James P. Poole.*

969. LONG, BAYARD. Regarding *Gentiana Andrewsii* in the coastal plain of New Jersey. *Rhodora* 22: 104–110. 1920.—The author finds that earlier records of the occurrence of this species in the region referred to were apparently due to errors in the determination of species and that in reality it is one of the rarest of plants in the Coastal Plain region. The evidence also seems to lead to the logical conclusion that the few stations reported within the region are extensions of the Piedmont region.—*James P. Poole.*

970. LONG, C. A. E. Some noteworthy *Matinicus* plants. *Rhodora* 22: 110–111. 1920.—A list of some of the more interesting plants found growing on the island of *Matinicus* by the author.—*James P. Poole.*

971. MÖRNER, CARL TH. Botaniska anteckningar från Norrlands-färder 1916–1919. [Notes from journeys in Norrland (northern Sweden) 1916–1919.] *Bot. Notiser* 1920: 33–40. 1920.—The author gives the localities for 37 species, together with geographic and ecological notes concerning them.—*P. A. Rydberg.*

972. MOUSLEY, H. Further notes on the orchids of Hatley, Stanstead County, Quebec, 1919. *Canadian Field-Nat.* 34: 44–47. 1920.—The habit and habitat of 12 species of orchids are presented. In all, 30 species of orchids were found within an area of 4 square miles.—*W. H. Emig.*

973. NELSON, JAMES C. Additions to the flora of western Oregon during 1919. *Torreyia* 20: 37–45. 1920.—Indigenous species not mentioned in Piper & Beattie's *Flora of the Northwest Coast* are found within the limits of that manual in 3 regions of western Oregon: (1) Along the Calapooia Range, (2) along the Cascades in the Mt. Jefferson region, and (3) along the lower course of the Columbia. In addition to these, the number of naturalized exotic species is constantly increasing. A list is given of 90 species collected in western Oregon during the season of 1919, none of which is mentioned in the *Flora of the Northwest Coast*; 54 of these are foreign. Of the indigenous species, 7 are from the Calapooias, 12 from Mt. Jefferson, and 5 from the lower Columbia. To the 1617 species of the *Flora of the Northwest Coast*, 309 have now been added. Previous lists have appeared in *Torreyia* 18: 21–35, 220–226.—*J. C. Nelson.*

974. PERSSON, JOHN. Till Brobytraktens flora. [Additions to the flora of the Broby region, Sweden.] *Bot. Notiser* 1920: 101–102. 1920.—The author notes 23 additions of phanerogams and mosses since the second edition of Areschoug's *Flora*. The greatest rarity of the region, *Orchis latifolia*, has disappeared, and a few others may be hard to rediscover.—*P. A. Rydberg.*

975. POOL, RAYMOND J. Pin oak in Nebraska. *Torreyia* 20: 50–52. 1920.—*Quercus palustris* Du Roi was collected by Thomas D. Howe near Table Rock, Pawnee County, Nebraska, in September, 1919, evidently native. This is the first recorded occurrence in the State. Eleven species of *Quercus* are now known to occur in Nebraska.—*J. C. Nelson.*



976. RÖLL, J. Über *Sphagnum riparium* Ang. und über seine Verbreitung im hercynischen Florengbiet. [Concerning *Sphagnum riparium* and its distribution in the Hercynic Flora.] *Hedwigia* 61: 176-182. 1919.—The stations for *Sphagnum riparium* in the Hercynic flora are recorded, together with notes on ecological factors. Apparently there are many ecological variations. In dry localities the moss is only a few centimeters high; leaves and branches are very crowded. The stem leaves vary very little but the branch leaves assume various forms, depending on the location.—*Ernst Artschwager*.

977. SAMUELSSON, GUNNAR. Anteckningar från Torneträsk-området. [Notes from the region of Torneträsk (a lake in Lappland, Sweden).] *Bot. Notiser* 1920: 51-61. 1920.—The author gives a general description of the arctic-alpine vegetation, gives lists of plants of 3 different formations, and a list of localities of nearly 150 species which had been found at altitudes not strictly belonging to their altitudinal ranges.—*P. A. Rydberg*.

978. STANDLEY, PAUL C. *Stachys lanata* in Ontario. *Rhodora* 22: 128. 1920.—The author reports the occurrence of this species near Owen Sound, Ontario. Although the literature has not been searched thoroughly he thinks that perhaps this plant, which is native of the Caucasus region, has not been reported previously from North America.—*James P. Poole*.

979. STEVENS, O. A. The geographical distribution of North Dakota plants. *Amer. Jour. Bot.* 7: 231-242. 1 fig. 1920.—The vascular plants of the North Dakota flora may be divided into 6 main groups: (1) Those which are essentially eastern in their distribution and reach only the eastern part of the state; (2) those which are eastern but extend to the western part of the state; (3) those which are essentially western and reach only the western part of the state; (4) those which are western but extend to the eastern part of the state; (5) cosmopolitan plants; and (6) introduced plants. Characteristic members of these groups are enumerated and discussed.—The state lies almost wholly within the Transition life zone. The few members of its flora which belong to the Canadian zone or to the Upper Austral zone are enumerated. The plants which are common to North Dakota and to New Mexico are studied as to their comparative distribution in the 2 states with reference to life zones.—Some sand dune species, some introduced ones, and certain others of particular interest are discussed.—*E. W. Sinnott*.

980. THOMPSON, H. STUART. Habitats of *Hypericum humifusum*. *Jour. Botany* 57: 195-196, 225-226. 1919.—This plant was found in the turf of woodland paths over limestone in northern Somerset County. In most of the texts it is said to occur in places which would indicate a gravelly, sandy, or heathy acid soil. A later observation has shown the plant chiefly confined in Cornwall and Devonshire to mossy crevices in stone walls and dry hedge banks by roadsides on granite and slate. It was found only twice on heaths or commons. One or two plants only occur in a place. The author believes that the distribution has been much influenced by man. Brief notes on the soil preference of *Juncus tenuis* and *Erodium maritimum* are given.—*K. M. Wiegand*.

981. THOMSON, GEO. M. Naturalization of animals and plants. *New Zealand Jour. Sci. and Tech.* 1: 192. 1918.

982. VOGG, L. Aussterbende Pflanzen. [Plants becoming extinct.] *Ber. Naturw. Verein Schwaben u. Neuburg* 42: 184-186. 1919.—Attention is called to the threatened disappearance of certain species in the vicinity of Kutzenhausen, Bavaria, owing to the spread of cultivation. A few of the species listed grow on a railway embankment, a few others are found in a moist forest meadow, but the majority are inhabitants of boggy meadows. In addition to the plants on the eve of extinction the accompanying species are likewise enumerated.—*A. W. Evans*.

983. WOODRUFFE-PEACOCK, E. A. *Hypericum humifusum*. Jour. Botany 57: 225. 1919.—Notes called forth by H. STUART THOMPSON's article in this journal (see Bot. Absts. 8, Entry 980). The author makes use of 50 years of very carefully kept soil records for Lincolnshire. He shows the percentage distribution of this *Hypericum* in the different soils. It is calciphobe, and typically a plant of the open woodland of the older decaying stages passing into calluna moorland. In general the observations bear out those of Thompson and BENTHAM.—K. M. Wiegand.

984. ZINSMEISTER, J. B. Weitere Beiträge zur Flora von Augsburg und Schwaben. [Further contributions to the flora of Augsburg and Swabia.] Ber. Naturw. Verein Schwaben u. Neuburg 42: 264-270. 1919.—The author lists 4 pteridophytes and 122 spermatophytes from the region in question, giving one or more definite stations in each case. A hybrid origin is indicated in 18 instances.—A. W. Evans.

### APPLIED ECOLOGY

985. MUNNS, E. N. Some biological and economic aspects of chaparral. Jour. Forestry 17: 9-14. 1919.—See Bot. Absts. 1, Entry 1147; 3, Entry 560.

986. TOUMEX, J. W. The relation of gray birch to the regeneration of white pine. Jour. Forestry 17: 15-20. 1919.—See Bot. Absts. 3, Entry 578.

### FOREST BOTANY AND FORESTRY

RAPHAEL ZON, *Editor*

J. V. HOFMANN, *Assistant Editor*

(See also in this issue Entries 768, 864, 1129, 1176, 1206, 1351, 1365, 1368, 1374, 1382, 1390, 1392, 1395, 1397, 1402, 1406, 1408, 1414, 1423, 1435, 1468, 1492, 1540, 1549, 1560, 1565)

987. ANDERSON, J. Paper from Alaska. Sci. Amer. 124: 64, 75. 3 fig. 1921.—A popular article considering the supply of pulpwood in Alaska. It is stated that the National Forests of Alaska contain resources sufficient to produce 1,500,000 tons of paper annually in perpetuity.—Chas. H. Otis.

988. ANONYMOUS. El algarroba. [The carob bean.] Informacion Agric. [Madrid] 10: 501-504. 6 fig. 1920.

989. ANONYMOUS. Grundbesitz und Vermögensabgabe in Oesterreich. [Landed estates and property taxes in Austria.] Allg. Forst- u. Jagdzeitg. 38: 61-62. 1920.—A discussion of the tax law under consideration by the Ministry of Finance. Assessments on forest estates will be upon their vastly inflated present sale value, as they fall into the classification of "large estates." Medium and small estates have a lower valuation based on pre-war values. The result will be discouraging to Austrian forestry and threatens to cause the breaking up of many large forest estates and demoralization of the lumber trade.—F. S. Baker.

990. ANONYMOUS. Mitteilungen über die Ergebnisse der Sächsischen Staatsforstverwaltung im Jahre 1918. [Administration report of state forests of Saxony for 1918.] Tharander Forst. Jahrb. 71: 264-268. 1920.—Classified tables of areas, income, and expenditures are given. The total forest area of the state forests of Saxony at the end of 1918 was 180,989 hectares, of which 172,934 hectares is forest land and 8,055 hectares non-forest land. This is an increase of only 49 hectares over 1917. The income from the state forests was 31,393,339 marks—an increase of 5,057,450 marks over 1917. The increase in income was partly due to the rising price of wood. The price per festmeter of fuelwood increased from 21.72 marks in 1913 and 27.37 marks in 1916 to 44.37 marks in 1918. The total income of the department of forestry was 32,431,903 marks—an increase of 5,228,776 marks over 1917. This is an



average income per hectare of 179.19 marks. The total expenditures, excepting the cost of the forest working plan station, was 11,367,764 marks—an increase of 3,697,011 marks over 1917. The expenditures averaged 62.81 marks per acre of forest land, that is, only 35.1 per cent of the total income.—*Joseph S. Illick.*

991. ANONYMOUS. Die Nachzucht des Vogelbeerbaumes und der Alpenerle. [Reproduction of mountain ash and alpine alder.] Schweiz. Zeitschr. Forstw. 71: 372–376. 3 pl. 1920.—A résumé of M. DECOPPET's paper read at the meeting of foresters. The mountain ash (*Sorbus aucuparia* L.) and the alpine alder (*Alnus viridis* DC.) occur throughout the forests of Switzerland from the lowest elevation to timber line. The mountain ash is especially adapted to the steep hillsides, due to its resistance to snow break. It sprouts prolifically when the main stem is broken, and grows rapidly. Reseeding is rather slow, and experiments have shown that seed should be secured from localities with similar growing conditions. The same applies to the alders.—*J. B. Hofmann.*

992. ANONYMOUS. Oesterreichs Holzmarktlage. [Austrian timber market conditions.] Allg. Forst- u. Jagdzeitg. 38: 74–75. 1920.—The timber market is in a demoralized condition. Prices are unreasonably high but indications are that the peak is not reached. Prices for different grades of lumber and round wood for the first week of March, 1920, are given.—*F. S. Baker.*

993. ANONYMOUS. Schluss der "wilden" Holzschlägerungen im Wienerwalde. [End of the "wild" cutting in the Vienna forest.] Allg. Forst- u. Jagdzeitg. 38: 69. 1920.—On account of the fire wood famine in Vienna in the winter of 1919, unregulated cutting was allowed in the Vienna forest, in which a great part of the forest was ruthlessly destroyed.—*F. S. Baker.*

994. ANONYMOUS. The tragedy of our American forests. Sci. Amer. 123: 540. 1920.

995. ANONYMOUS. Was ist Eichengerbholz? [What is oak tanning wood?] Allg. Forst- u. Jagdzeitg. 38: 63. 1920.—Oak for tanning extract is in high demand in Germany on account of the impossibility of importing foreign sources of extract due to the abnormally high price. Wood is accepted as small as 12 cm. at the small end and  $\frac{3}{4}$  to  $1\frac{1}{2}$  meters long. Both heart and sapwood must be generally sound. The wood is bought by weight and will bring 7.5 marks per centner delivered on board cars or ships. Farmers are urged to clear lands covered with small crooked oaks that have been hitherto unmerchantable.—*F. S. Baker.*

996. ANONYMOUS. Die Vergrößerung der italienischen Staatsforste. [The expansion of Italy's state forests.] Allg. Forst- u. Jagdzeitg. 38: 68. 1920.—A short news item. The extension of the Italian boundaries, according to the treaty of St. Germain, gives Italy important forests between the Julian Alps and Carniola. The state forest of Tarvis contained 12,000 hectares of forest, 1000 of pasture, and 10,000 of stony land unfit for agriculture; 1800 cubic meters per hectare is the average annual production.—*F. S. Baker.*

997. ANONYMOUS. Zu den geplanten Steuermaßnahmen in Oesterreich. [Regarding the plans for tax assessment in Austria.] Allg. Forst- u. Jagdzeitg. 38: 73–74. 1920.—The increased taxes on land values threaten to cause the burdening of large forest holdings with intolerable mortgages or to force their sale to the state. The land tax is increased from 25 to 40 per cent of the official net income (including the tax remissions on account of damage to the property by the elements). There is furthermore a surtax on a sliding scale depending upon the value of the property as well as the enhancement of its value during the past year. Also, a "trade tax" of  $1\frac{1}{2}$  per cent is levied on all commercial transactions, but does not apply to wood cut by the owner for his own use.—*F. S. Baker.*

998. ANONYMOUS. [Rev. of: BROWN, N. C. Forest products, their manufacture and use. xix + 471 p. John Wiley & Sons, New York, Chapman & Hall, London, 1919.] Sci. Prog. [London] 15: 320. 1920.

999. ANONYMOUS. [Rev. of: HENRY, A. *Forests, woods, and trees in relation to hygiene. xii + 214 p., 28 illus., 21 maps and plans.* Constable & Co.: London, 1919.] *Sci. Prog.* 15: 145-146. 1920.

1000. BALSEMAO, E. DE. *Influencia das florestas na atmosfera.* [Influence of the forests on the atmosphere.] *Bul. Agric. Nova Goa* [Portuguese East India] 1: 152-157. 1919.—Reprint of an article from *Official Bull. of Portuguese India* for 1883, and based on an article in *Revue des Deux Mondes*.—J. A. Stevenson.

1001. BARBOUR, W. R. *Argentine and Paraguay forest conditions.* *Jour. Forestry* 18: 823-830. 1920.—A brief description is given of the condition of the forest in Argentina and Paraguay with some of the uses of the principal woods. The most important forest industry of the region is the production of tannin from quebracho. Very little is being done for the extension or practice of forestry, planting being mostly confined to the landscape garden and windbreaks.—E. N. Munns.

1002. BERGER, HANS. *Die Carl Heyersche Formel.* [Carl Heyer's formula.] *Schweiz. Zeitschr. Forstw.* 71: 290-296. 1 pl. 1920.—The author points out the discrepancy in Heuer's formula when applied to other than normal and mature forests. The use of the average increment based on yield at time of cutting distributes the increment over periods of growth that are not measurable on this basis. Comparisons with the Bade formula shows wide variations in a stand of 50 hectares 50 years old. The conclusion is reached that it would be advisable to manage the forests with the application of less formula and more common sense.—J. B. Hofmann.

1003. BERKHOUT, A. H. *Das Messen der Bäume hinsichtlich ihres Zuwachses.* [Growth measurements of trees.] *Schweiz. Zeitschr. Forstw.* 71: 377-379. 1920.—A formula is worked out on the basis of relation of diameter to cubic contents. Ten trees are selected in each type. One group is in small, one in medium, and one in large trees. The average diameter and cubic contents are obtained by careful measurement, and the average tree is used for stand to be studied. If desirable, the trees measured may be remeasured at any time and the annual or periodic increment may be obtained. It is recommended that the tree be climbed and measured.—J. B. Hofmann.

1004. BERKHOUT, A. H. *Het meten der boomen in verband met hun aanwas.* [The measurement of trees in connection with their growth.] *Mededeel. Landbouwhoogeschool Wageningen* 17: 109-225. *Fig. 16.* 1920.—It is desirable in measuring lumber for forest calculations that the laws of probability be more generally used. A great number of examples are given.—J. C. Th. Uphof.

1005. BOAS, I. H. *Preservation of piling against marine borers.* *Australian Forest Jour.* 3: 315-316. 1920.—The advantages of protection by impregnation with preservatives over protection by external coatings are discussed. The experience of American experts is also summarized.—C. F. Korstian.

1006. BOODT. *De bebossching van Drente.* [The forestation of Drente.] *Tijdschr. Nederland Heidemaatschappij* 32: 192-200. 1920.—The forestation of the province of Drente (Netherlands) is most difficult. On clay-loam soils (1) *Pinus laricio* var. *austriaca*, or (2) growing yellow lupines followed by *Picea excelsa*, are recommended. On the heather fields *Pinus sylvestris* with oak and *Picea excelsa* are advisable. The former will form the main growth whereas the latter and oak form the undergrowth.—J. C. Th. Uphof.

1007. BORGMANN. [Rev. of: ENDIES, M. *Lehrbuch der Waldrechnung und Forststatik.* (Text-book of forest valuation and statics.) Berlin, 1919.] *Forst. Rundschau* 21: 13. 1920.—A short general notice of the third edition noting a few additions and changes.—F. S. Baker.



1008. BORGMANN. [Rev. of: MARTIN, H. *Die forstliche Statik*. [Forest statics.] 2nd ed. Berlin, 1918.] *Forst. Rundschau* 21: 10-12. 1920.—A criticism of some of Martin's points of view is included.—*F. S. Baker*.

1009. BREWSTER, DONALD R. A plan for the advancement of forestry in Wisconsin. *Jour. Forestry* 18: 792-802. 1920.—The area of cut-over land in Wisconsin amounts to about three million acres. Much of this land is now idle and unproductive. The ordinary organization of the State Board of Forestry is not thought advisable and a conservation council is proposed consisting of small groups of men chosen from each congressional district. The financial support would be derived from contributions from interested parties or from assessments upon organizations. The principal lines of work of this council would be the prevention and control of fires, the expansion of state forests, the reform of tax laws, survey of timber resources, and the establishment of experiment stations to work out forest problems.—*E. N. Munns*.

1010. BREWSTER, DONALD R. A plan for combined insurance and fire protection. *Jour. Forestry* 18: 803-805. 1920.—A plan is outlined to make forest protection and insurance automatic and self-supporting, and at the same time increase the area of timber lands under forest management. All forest lands would be assessed a small amount per acre to cover the cost of this protection and insurance, with exemption to wood lots and isolated areas. Brush lands would be considered of sufficient value to warrant protection and insurance until they were placed in a productive position. The advantages claimed are that the property owner would feel he was getting protection as well as insurance, and the distribution of risk, if combined with the tax reform, would make the production of timber a safer and more attractive investment for the private owner.—*E. N. Munns*.

1011. BUTTRICK, P. L. American trees for forest planting in France. *Jour. Forestry* 18: 815-822. 1920.—A number of conifers and hardwoods are listed which have been proved of value in France for forest planting, together with a description of the sites and places where such trees would do best.—*E. N. Munns*.

1012. CHAPMAN, R. W. Physical properties of some South Australian-grown pines. *Trans. and Proc. Roy. Soc. South Australia* 40: 405-427. 1919.

1013. CHIDSEY, C. E. Knots and boles on forest trees. *Sci. Amer. Monthly* 2: 209-210. 5 fig. 1920.—Discussion of causes of the curious and varied formations of grain in timber.—*Chas. H. Otis*.

1014. DACY, G. H. Forewarnings about forest fires. *Sci. Amer.* 123: 495, 508. 2 fig. 1920.—Describes a mechanical display by the U. S. A. Forest Service which illustrates pictorially how forest fires originate.—*Chas. H. Otis*.

1015. DAHL, A. L. Winter fuel from our woodlands. *Sci. Amer.* 123: 495, 508. 2 fig. 1920.

1016. DALEY, JOHN E. Production and characteristics of Mitscherlich sulphite pulp. *Paper* 26<sup>24</sup>: 17, 30. 1920.

1017. FRYER, C. P. Light burning in California forests. *Sci. Amer.* 123: 543. 1920.

1018. FULLER, GEORGE D. Forest products. [Rev. of: BROWN, N. C. *Forest products*. xix + 471 p., 120 fig. Wiley & Sons: New York, 1919.] *Bot. Gaz.* 68: 479-480. 1920.

1019. FULLER, GEORGE D. Economic woods. [Rev. of: RECORD, S. J. *Identification of the economic woods of the United States*. 157 p., 6 pl., 15 fig. Wiley & Sons: New York, 1919.] *Bot. Gaz.* 68: 480. 1919.

1020. GERRY, ELOISE. **American storax production: results of different methods of tapping red gum trees.** Jour. Forestry 19: 15-24. 1921.—Commercial storax used in pharmacy is obtained from the Orient. During the war extracts were made from the red gum (*Liquidambar styraciflua*). Experiments were carried out in Louisiana to determine the proper methods. Heaviest yields were obtained from trees with parallel horizontal scarification as against the vertical scarring or girdling. Tapping early in spring gave the heaviest yields. Some substance should be used to prevent the entrance of decay on the open wounds.—*E. N. Munns.*

1021. GERRY, ELOISE. **Microscopy of pulpwoods.** Paper 267: 19-40, 50. *Pl.* 1-8, *fig.* 1-5. 1920.—A complete description of the woods and wood fibers used in the manufacture of pulp, and keys for identifying the same.—*H. N. Lee.*

1022. HAWLEY, RALPH C. **Forestry at Nehasane Park.** Jour. Forestry 18: 681-692. 1920.—The cuttings in this park 20 years ago were the first made under the direction of a forester. A 2nd cut has been planned under the direction of a resident forester. In the 1st cutting the selection system was used, which has been shown to be inadvisable in this type of country. Markets now accept woods which formerly were discarded, and small sizes are as much in demand as the larger ones.—Two general types are recognized, the balsam swamp or softwood land, and the hardwood type. In these the percentage of dominants in the reproduction does not differ materially from that in the older stand. Criticisms of the more recent cuttings answered by the author are: Lack of a sustained annual yield basis; 2nd cut too heavy; too rigid a diameter limit applied; cuttings show lack of immediate supervision by a forester; spruce is not increasing; cull hardwoods remain on the ground; and the large burn is not being made productive. It is shown that the work has thus far been a credit to the forestry profession, though the forester in charge has failed to secure the establishment of a thrifty forest of young growth unhampered by heavy-foliaged hardwoods. The administration and improvements made on the property are excellent.—*E. N. Munns.*

1023. HEINICKE. **Die Reinertragsübersichten der Sächs. Staatsforsten für das Jahr 1918.** [Net yield of state forests of Saxony for 1918.] Tharander Forst. Jahrb. 71: 59-71. 1920.—A series of 11 tables giving a classified account of the receipts and expenditures during 1918 of the 110 state forests of Saxony; also a summary of receipts and expenditures by forest districts. The total receipts from the 110 state forests was 31,616,330 marks and the expenditures 7,530,860 marks, leaving a net yield of 24,085,470 marks. The total forest capital of the state forests of Saxony is placed at 448,151,700 marks.—*Joseph S. Illick.*

1024. JENTSCH. **Die Stellung des Waldes und der Waldwirtschaft im Volksstaate mit besonderer Beziehung auf Sachsen.** [Where forestry stands in Germany.] Tharander Forst. Jahrb. 71: 1-29. 1920.—The war made heavy demands upon the forests of Germany which will continue during the reconstruction period. Methods of handling and controlling forests will change in consequence of the war and the subsequent revolution. Important economic questions and policies are discussed, among them the socialization of forests, an embargo on timber, effect of rising prices of wood on forest management, and stronger control over privately-owned forests. Expropriation of private forests is not regarded as feasible, but stronger state control over privately-owned forest land is recommended. The latter is desirable especially in Saxony, where private forests are numerous, and only 173 out of a total of 67,030 private forest holdings exceed 250 acres in size.—*Joseph S. Illick.*

1025. KRAUCH, HERMANN. **Alinement volume tables.** Jour. Forestry 18: 831-832. 1 *fig.* 1920.—The method of preparing alinement volume charts and the use of a volume table prepared in this manner is described. Alinement charts make possible a rapid transcription of volume data with less chance for error.—*E. N. Munns.*

1026. KRESS, OTTO, C. J. HUMPHREY, AND C. AUDREY RICHARDS. **Guarding against fungi in wood and wood pulp.** Paper 261<sup>10-12</sup>: 13-15, 21-22, 23-25. 11 *fig.* 1920.—Characteristics and qualities of papers made from sound wood or wood pulp as compared with that from



decayed material are discussed, as well as methods of infection, differences in appearance of, effects of, and methods of controlling, molds and wood-destroying fungi.—*H. N. Lee.*

1027. MAHOOD, S. A., AND D. E. CABLE. Decay of woodpulp. Paper 25<sup>24</sup>: 11-12. 1920.—A chemical investigation of sound and infected ground wood pulp.—*H. N. Lee.*

1028. MARTIN. Die Fortbildung des Sächsischen Forsteinrichtungsverfahrens. [Development of the Saxon method of forest organization.] Tharander Forst. Jahrb. 71: 30-57, 72-89. 1920.—The final 4 chapters of a serial on forest organization in Saxony. The results and conclusions of 100 years of consistent and continuous development along the same line of organization are set forth. The determination of felling and management methods are discussed under the following headings: Choice of species, stand establishment, stand form, stand development, stand improvement, and soil treatment. The theory and practice of forest rent is discussed. The need for revision and control of organization plans is emphasized, the importance of regulating the entire business of forest organization is set forth, and the desirability of an effective coördination of forest administration, silviculture, forest investigation, and forest organization is stressed.—*Joseph S. Illick.*

1029. MARTIN. Das Verhalten von Kiefern-Buchen-Mischbeständen in ökonomischer Hinsicht, mit besonderer Rücksicht auf die forstlichen Verhältnisse Sachsens. [Mixed stands of Scotch pine and beech in Saxony.] Tharander Forst. Jahrb. 71: 269-282. 1920. [To be continued.]—Data collected to date show that pure stands of Norway spruce surpassed mixed stands of beech and Scotch pine in volume and value production. There are other determining factors which should be considered. The author believes that there are numerous areas, aggregating a large acreage, between the good hard wood soil and the poor pine soil well adapted to the production of mixed stands of Scotch pine and beech.—*Joseph S. Illick.*

1030. MOUNT, H. A. In the modern sawmill. Sci. Amer. 123: 548, 557. 4 fig. 1920.—Machines and methods by which the cutting up of logs is put on a basis of extreme economy.—*Chas. H. Otis.*

1031. MUNGER, T. T. Second remeasurement of permanent sample plots of Douglas fir on the west slope of the Cascades in Oregon. Jour. Forestry 18: 833-836. 1920.—On sample plots in Douglas fir it is found that there has been a loss of 41 trees per acre in 10 years, with an increase in diameter for the stand of from 13.7 to 16.3 inches, the basal area increasing from 200 to 224 square feet. The annual increment in cubic feet has fallen from 188 in the 1st 5 years to 80 in the 2nd, or from 1259 board feet in the 1st to 828 in the 2nd 5 years. The average cubic-foot volume of the trees in 1910 was 45; in 1915, 54; and in 1920, 66.—*E. N. Munns.*

1032. MUNNS, E. N. Chaparral cover, run-off, and erosion. Jour. Forestry 18: 806-814. 1920.—A severe fire in 1919 destroyed some 150,000 acres of brush cover in southern California. Erosion was very severe following this fire and destroyed much of the engineering work designed to prevent floods. On eroded areas a small stand of annuals and perennials came up from dormant seeds, which were present in much greater numbers on unburned lands. The soil of slightly eroded areas contained seeds of almost as many species and individuals as did the soil in non-burned and non-eroded areas.—*E. N. Munns.*

1033. MUNNS, E. N. High temperatures and eucalyptus. Jour. Forestry 19: 25-33. 1921.—High temperatures in southern California caused "burning" of trees, due largely to extreme droughty conditions. The amount of injury depended upon the abundance of water or the character of the soil. Trees on loamy soils suffered least. *Eucalyptus rostrata* and *E. terreticornis* of all the planted eucalypts withstood the droughty conditions best.—*E. N. Munns.*

1034. PEARSON, G. A. **Brush disposal in western yellow pine.** Jour. Forestry 19: 36-38. 1921.—Studies have been made since 1908 on methods of brush disposal. Sheep damage is prevented by piling the brush and logs together, though heavy brush hinders germination because of depth of litter. With no grazing in such places the grass grows very heavily and root competition is very keen. Where the brush is piled and burned seedlings do best, but because of the succulent vegetation sheep damage is very severe. When protected from grazing growth is exceedingly rapid. Protection from wind and sun is favorable, but detrimental if at the expense of soil-moisture loss by competition with other plants. Under controlled grazing, piling and burning give best results but methods are insignificant when compared with grazing.—*E. N. Munn.*

1035. PELLETER, WALDEMAR. **Wiederbesiedlung und Forstwirtschaft.** [Colonization and forestry.] Oesterreich. Forst- u. Jagdzeitg. 38: 30-31. 1920.—Following the war there has been a strong movement in Austria back to the land, encouraged by colonization laws that tend to break up large estates. This movement is closely interrelated with forestry, since in many cases it will result in the clearing of forested lands for farms. Many such lands have been under cultivation in the past but have been abandoned after the fertility of the forest humus became exhausted. The lands have reverted to forest and have been bought up in large blocks and placed under forest management. This new movement will decrease the area of such forests and will break up their unity to such an extent that economical management and logging will be very difficult, if not impossible. The interests of forestry must be protected for the good of the state and in some places for the good of these colonization schemes themselves, as in certain valleys the existence of farms will depend upon the possibility of the owner finding an occupation to supplement his farming. A permanent forest industry alone can furnish this supplementary occupation.—*F. S. Baker.*

1036. PILlichODY, A. **Ein Erlenkopfhohlzbestand.** [Alder coppice.] Schweiz. Zeitschr. Forstw. 71: 289-290. 1 pl. 1920.—Alder coppice is not as common as willow (*Salix alba*), especially in the Rhone River bottom. At Epende there are about 4 hectares with stumps 10 to 15 meters apart. The stumps are knotty, partly decayed, hollow, and up to .80 meter in diameter, 1.5-2 meters high, and 70-80 years old. This coppice is on a clay soil and is very productive. Each stump supports 6-8 prominent sprouts that provide fuel wood in 10-15 years. The yield averages 150 cubic meters with an annual increment of 10-12 cubic meters.—*J. V. Hofmann.*

1037. RECORD, S. J. **From wood to cloth.** Sci. Amer. 123: 591, 601-602. 4 fig. 1920.

1038. RILEY, SMITH. **A national game policy.** Jour. Forestry 18: 767-774. 1920.—A plea is made for the adoption of a national game policy which would call for adequate game protection in order not only to provide hunting but to provide material for active observations of the haunts and activities of wild animals generally.—*E. N. Munn.*

1039. RUBNER, K. **Die waldbaulichen Folgerungen des Urwaldes.** [The conclusions which forest culture derives from the virgin forest.] Naturw. Zeitschr. Forst- u. Landw. 18: 201-213. 1920.—It is shown that the cultural forest is not to be considered as primarily unnatural, as is often thought, and that the composition of the virgin forest is not what it is commonly supposed to be. The virgin forests may be pure or extremely mixed; the character is directly dependent upon the climatic and edaphic conditions, and the ability of the various species to adapt themselves. The virgin forest is not typically selection, but more nearly a shelterwood forest. Much is to be learned regarding the value of humus in reproduction, and it is not to be considered that natural regeneration under the virgin forest develops the ideal conditions. It is admitted that clear-cutting, with all its faults, has helped considerably to perpetuate the forests and the more valuable species in Germany.—*J. Roesser.*

1040. S., W. **Waldschutz.** [Forest protection.] Oesterreich Forst- u. Jagdzeitg. 38: 53-54. 1920.—A reply to an article of same title by H. SAMMEREYER (see Bot. Absts. 4,



Entry 463). A wave of forest destruction is at present sweeping over the entire world. This destruction threatens to make wildernesses of many regions as it has made a desert of the Sahara in the past, while it also tends to arrest the purification of the air, which is one of the functions of the forest. Present forest areas should not be reduced. In Austria the futility of clearing forest land for permanent agriculture is shown by the fact that many such lands have been cultivated in the past but have been allowed to revert to forest when the fertility of the forest humus was exhausted and the productivity fell too low for economical handling for agriculture. Grazing in forests is incompatible with silviculture and must be stopped. The first requisite in securing forest protection is a world-wide educational campaign through schools, clubs, the press, etc., to develop a deeper regard for the forests and secure a more general recognition of their economic indispensability in any progressive state.—*F. S. Baker.*

1041. SEIBERT, FLORENCE B., AND JESSIE E. MINOR. The differentiation of sulphite pulps. Paper 25<sup>21</sup>: 17–20. 7 fig. 1920.—A description of a method using a combination of malachite green and Congo red to show very accurately the presence or absence of lignocellulose.—*H. N. Lee.*

1042. SEILER, HANS. Die Holznot in Kärnten. [The wood famine in Carinthia.] Allg. Forst- u. Jagdzeitg. 38: 67–68. 1920.—The lack of firewood in the cities was particularly marked in Carinthia during the winter of 1919. This was due to many causes, the chief ones being general insufficiency of supplies of all kinds, the rising stumpage prices which have encouraged small owners to hold their timber, and the depletion of the war when great quantities of the most accessible fire-wood were cut to supply the army. Organization of wood producers and dealers, the construction of roads, tramways, etc., and purchase of forest land by municipalities, associations, and the like, is urged as the best means of escaping repetitions of such a famine.—*F. S. Baker.*

1043. TUBEUF, C. VON. Verschiedenes Verhalten gegen Windströmung. [Different responses to air currents.] Naturw. Zeitschr. Forst- u. Landw. 18: 186–187. 1920.—Tubeuf refers to an illustrated paper under this title in Schweiz. Zeitschr. Forstw. 71: 177–179. 1920 (see Bot. Absts. 7, Entry 813) by A. PILlichODY. The photograph in the latter's paper shows a row of broad crowned Canadian poplars, which have grown up sloping in the direction of the valley wind, and a row of Italian pyramid poplars (evidently Lombardy poplars) which have grown straight, to all appearances unaffected by the wind-movement. The local custom of trimming, which leaves but a small broomlike crown on the latter, and a wide-spreading crown tip on the former, accentuates the different effects produced by the wind-movement. The two trees are briefly compared as to their cultural desirability.—*J. Roesser.*

1044. VIDAL, Y. L. Micrography of sycamore pulp. Paper 27<sup>3</sup>: 18–19. 1920. [Translation from La Papeterie 62: 434–439. Fig. 1. 1920.]—The yield of pulp and possibilities for paper making are discussed. The dimensions of the elements and the histology of the vessels are given in detail.—*H. N. Lee.*

1045. WATSON, RUSSELL. Forest descriptions on the forest survey of the Groton State Forest, Vermont. Jour. Forestry 19: 43–50. 1921.—On the Groton Forest greater detail was needed than was obtained by using the standard forest description forms. A detailed questionnaire was built up to give data on the stand and the characteristics of the area, noting the silvical conditions as to planting, thinning, and final cutting.—*E. N. Munns.*

1046. WEIDMAN, ROBERT H. The windfall problem in the Klamath region, Oregon. Jour. Forestry 18: 837–843. 1920.—Heavy windfall losses occur annually throughout the north Pacific Coast. It has been found that the windfall losses, on cut-over land especially, are heaviest during the first years following cutting; as the trees become wind-firm the losses gradually decrease. In the virgin forest the loss from year to year is more or less constant except for exceptional heavy winds occasioning very heavy losses at infrequent intervals. Apparently neither quality of tree nor of site enables the trees to withstand these storms; and trees of all crown characters appear to suffer equally.—*E. N. Munns.*

1047. WHITE, DAVID G. Standardization of lumber sizes and grades. *Jour. Forestry* 19: 34-35. 1921.—The American Lumber Congress is supporting a proposed change in the manufacture of lumber. At the present time there is no standardization of grades in woods or in building materials. It is proposed to reduce the number of grades of finish materials and to unify the nomenclature of defects in structural woods.—*E. N. Munns.*

1048. WICKENDEN, H. R. A sketch on Swedish forestry from an American standpoint. *Jour. Forestry* 18: 775-791. 1920.—A general description is given of the organization of the Swedish forest service with some of its regulations and forest practices. The general subject of forestry in Sweden is very similar to that in America, though the former country has proceeded much farther toward forest management. Rotation varies from 80 to 150 years, depending upon climatic conditions, with clear cutting usually employed, except upon special areas where protection is needed. In these situations a selection system is used. Thinnings are made frequently but up to the present have been very slight, the tendency being toward heavier thinnings, especially in the crown. Logging is done chiefly during times of snow and the hauling is done by sleighs. The average saw log is between 14 and 19 feet long and from 7 to 9 inches in diameter. The logs are taken from the mill and driven down streams, which have been very greatly improved. Forest planting is carried on extensively through sowing in seed spots. Local seed has been proved superior to foreign seed. The tendency generally is for a shorter rotation and for volume production rather than quality. A constant increase in the price of lumber is expected at the rate of 2 per cent a year.—*E. N. Munns.*

1049. WISLICENUS, H. VON. Das pflanzenchemische Institut der Sächsischen Forstakademie und forstlichen Versuchsanstalt zu Tharandt und die Pflege der Pflanzenchemie im allgemeinen, der stofflichen Holzforschung im besonderen. [Plant chemistry institute and forest experiment station at Tharandt, Saxony.] *Tharander Forst. Jahrb.* 71: 90-106. 1920.—An academic discussion of the place of plant chemistry in a forest school curriculum and a consideration of the distinct fields covered by industrial research institutes and laboratories connected with educational institutions. The urgent need for a fuller and better knowledge of the chemistry of forest products was brought to full light during the war. Forest products laboratories are a real and urgent need. Timber impregnation, seasoning of wood, and turpentine yield are among the problems considered.—*Joseph S. Illick.*

1050. WOODBRIDGE, R. G., JR. Nitrocellulose from wood pulp. *Paper* 267: 136-146. 1920.

1051. WOOLSEY, THEODORE S., JR. The development of a brush-disposal policy for the yellow pine forests of the southwest. *Jour. Forestry* 19: 39-42. 1921.—Notes are made on the brush-disposal policy in the southwest to the effect that brush burning is better than fire lines, which are generally impracticable as desired in the district. Where possible these lines should be located on ridges rather than in the canyons or on the slopes.—*E. N. Munns.*

## GENETICS

G. H. SHULL, *Editor*

J. P. KELLY, *Assistant Editor*

(See also in this issue Entries 769, 789, 796, 808, 809, 815, 819, 896, 1137, 1141, 1145, 1161, 1209, 1212, 1322, 1388, 1574)

1052. ADKINSON, JUNE. The behavior of bronchial asthma as an inherited character. *Genetics* 5: 363-418. 39 fig. 1920.—In a study of 400 cases of bronchial asthma, author found that 48 per cent gave a history of the occurrence of the disease in other members of the family. Asthmatics found sensitive to the cutaneous tests, more frequently give a family history positive for asthma than do the patients found non-sensitive to the cutaneous tests, but such histories do not furnish conclusions as to the cause, severity, prognosis or treatment in any given case. The tendency to hay-fever, asthma or allied condition is transmitted,



not the condition itself.—Thirty-eight family histories are analyzed with a more or less complete record of 91 matings in which parents or offspring were asthmatic or had hay-fever. In 4 matings where both parents were asthmatic, there were 9 asthmatic offspring, and 1 normal who transmitted asthma. In 34 cases, with one parent asthmatic and the other normal, but with positive family history, there were 60 asthmatic offspring, and 67 normal. In 17 matings, with one parent asthmatic and the other normal, with negative family history, there were 60 normal offspring. Where both parents were normal in 32 cases, with positive family histories, theoretically  $\frac{1}{4}$  would be asthmatic, and  $\frac{3}{4}$  normal, but in this series there were 3 times as many asthmatics as normal, there being 45 asthmatics and 15 normal.—Upon this data the writer concludes that bronchial asthma is inherited as a Mendelian trait recessive to the normal condition. In those asthmatics with one parent asthmatic and the other apparently normal, it is necessary to assume that the latter is simplex. The appearance of asthma in direct line in succeeding generations can be explained only on the supposition that for each generation, in the mating of the asthmatic and the new strain, the latter, though apparently normal, must in every instance carry asthma in the simplex condition in the germ-plasm (heterozygous). Those asthmatics with negative history are explained as duplex in respect to the character, the tendency being transmitted through several generations by antecedents who were themselves simplex.—*Robert A. Cooke.*

1053. ALVERDES, FRIEDRICH. Über das Manifestwerden der ererbten Anlage einer Abnormität. [On the manifestation of a hereditary primordium of an abnormality.] Biol. Zentralbl. 40: 473-480. 1920.—Abnormalities in structure of rudimentary 5th and 6th pairs of legs occurred (mostly in male individuals) in 1 pure line of *Cyclops viridis* but not in the control line, or, with one exception, in wild stock. Inheritance of abnormality is quite irregular. Sometimes normal parents produce abnormals, and abnormal parents frequently produce very few abnormals. Percentage of abnormals is always fairly low. Abnormality is very variable in its character; it is frequently marked on one side of an individual while other side is entirely normal. Author attributes results to inheritance of a more than normal lability of the primordium of the 5th and 6th pairs of legs.—*A. M. Banta.*

1054. ANCEL, P. Sur l'hermaphrodisme glandulaire. [On glandular hermaphroditism.] Compt. Rend. Soc. Biol. 83: 1642-1644. 1920.—Six pigs studied were hermaphrodite in that both glands were mixed, or one was true ovary, other was mixed or a testis. In mixed glands, the upper part was testicular, the lower ovarian. Wolffian duct persisted only on side where there was a testis or mixed gland. Uterus was well developed in all of them, but Fallopian tube was well developed only on side next to true ovary. Observations are held to support view that genital glands are normally hermaphrodite, with only one part developed. Author believes persistence of Wolffian duct, often observed in female, is due to presence of hermaphrodite gland or testis.—*A. Franklin Shull.*

1055. ANONYMOUS. Berichtigung. [A correction.] Zeitschr. Indukt. Abstamm. u. Vererb. 20: 295. 1919.—In NACHSTEIN, N. Die Analyse der Ergfactors bei *Drosophila* und deren zytologischen Grundlage. Zeitschr. Indukt. Abstamm.- u. Vererb. 20: 118-156. 1919, the labeling of figure 2, page 133, should be interchanged as follows: In the  $F_1$  generation the word "rotäugig" should read "weissäugig" and in the  $F_2$  generation the word "rotäugig" at the right should read "weissäugig".—*J. L. Collins.*

1056. ANONYMOUS. Better dairying by bull associations. Joint use of good sires improves herds. Jour. Heredity 10: 135. Mar., 1919.—A quotation from a News Letter of the U. S. Department of Agriculture. The advantage of coöperative bull associations are discussed briefly.—*Sewall Wright.*

1057. ANONYMOUS. Variation, selection and mutation in one of the protozoa. Jour. Heredity 10: 143. Mar., 1919.—Review of work of MIDDLETON and JENNINGS and of R. W. HEGNER, which indicates that heritably diverse strains may be selected out from a single vegetatively reproduced organism,—in this case *Arcella dentata*.—*J. H. Beaumont.*

1058. ANTHONY, R. D. *Asexual inheritance in the violet (Viola odorata)*. New York Agric. Exp. Sta. [Geneva] Tech. Bull. 76. 55 p., charts 1-10. 1920.—A study was made of the possibility of changing, through a series of selections, stem length and yield of the double violet, Marie Louise (*Viola odorata*), in order to throw light on the problem of bud selection in pome fruits. Eight hundred plants of this variety, the previous histories of which were unknown, were used as parent plants. Selections were made from these for long stem high yield, long stem low yield, short stem high yield, and short stem low yield, each year. Methods of selecting, corrections for vigor, and corrections for variations due to positions in the house are considered in detail. At the end of 5 years 4 groups had been isolated. Yield for each group was as follows: Long stem high yield,  $36.484 \pm 0.505$ ; long stem low yield,  $34.637 \pm 0.572$ ; short stem high yield,  $40.359 \pm 0.569$ ; short stem low yield,  $35.389 \pm 0.515$ . Yield is expressed in number of normal flowers. Stem length in each group is as follows: Long stem high yield,  $8.920 \pm 0.029$ ; short stem high yield,  $8.537 \pm 0.040$ ; long stem low yield,  $8.483 \pm 0.043$ ; short stem low yield,  $8.537 \pm 0.043$ . The unit of length was the half inch. All of the plants in each of the 4 groups traced back to a single one of 4 of the original 800 plants. "It follows then that we seemingly have proved only the existence of asexually inherited differences which probably were present before the experiment was begun."—*W. D. Valleau*.

1059. BARKER, E. EUGENE. *El mejoramiento de nuestras siembras por la selección*. [The improvement of our crops by means of selection.] Estacion Exp. Insular Puerto Rico Circ. 30. 24 p. 1920.—Popular account. No new methods presented.—*E. E. Barker*.

1060. BONNET, L. O. *Some observations concerning pollination of olives*. Fig and Olive Jour. 4<sup>12</sup>: 4. 1920.—Author discusses a one-season study made 20 years ago at Pomona, which indicated that some olive varieties are fully self-fertile and others more or less self-sterile.—*Howard B. Frost*.

1061. BOULENGER, M. F. *L'hérédité morbide*. [Inheritance of disease.] Scalpel 73: 669-676. 1920.

1062. BOUMAN, K. HERMAN. *Anthropologische Feststellungen über die Amsterdamer Schulbevölkerung*. [Anthropological discoveries on the school population of Amsterdam.] Nederlandsch. Tidschr. Geneesk. 64: 2374-2383. 1920.

1063. BRIDGES, CALVIN B. *The developmental stages at which mutations occur in the germ tract*. Proc. Soc. Exp. Biol. Med. 17: 1-2. 1919.—Study of critical cases among mutants and mosaics of *Drosophila melanogaster* has shown that mutation occurred (1) at or near maturation stages in most cases, (2) some time prior to maturation in few cases, (3) during early segmentation stage in few cases, and (4) in zygote immediately after fertilization in some cases (mosaics).—*C. W. Metz*.

1064. BURCH, D. S. *Harnessing heredity to improve the Nation's live stock*. U. S. Dept. Agric. Year Book 1919: 347-354. 3 fig. 1919.—The advantages to be expected from the use of pure-bred sires in livestock breedings are discussed in connection with the campaign sponsored jointly by the U. S. Department of Agriculture and a majority of the States for "Better Sires—Better Stock."—*Sewall Wright*.

1065. COMBY, J. *La tache bleue mongolique chez les enfants européens*. [The blue Mongolian spot on European children.] Arch. Med. Enfants 23: 321-337. 1920.

1066. CORRENS, C. *Die geschlechtliche Tendenz der Keimzellen gemischtgeschlechtiger Pflanzen*. [Sex tendency of germ-cells in plants of mixed sex.] Zeitschr. Bot. 12: 49-60. 2 fig. 1920.—Protonema were obtained by the regeneration from cells of the wall and the stalk of antheridia and archegonia in the monoecious moss *Funaria hygrometrica* which again produced normal male and female branches. Since such cells are near sister cells of sperms and eggs it is considered that sperms and eggs also possess maleness and femaleness as equal



potencies. Evidence is summarized that sex differentiation in monoecious and hermaphrodite flowering plants is likewise independent of special genetic determiners of sex, that here maleness and femaleness resides equally in the most differentiated of sex organs, and that sex differentiation is here purely a phenotypic development.—A. B. Stout.

1067. CORRENS, C. Individuen und Individualstoffe. [Individuals and individual substances.] Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 47: 65–66. 1919.

1068. CORRENS, C. Vererbungsversuche mit buntblättrigen Sippen. III. *Veronica gentianoides albocincta*. IV. Die *albomarmorata*- und *albpulverea*-Sippen. V. *Mercurialis annua versicolor* und *xantha*. [Genetical studies with variegated races. III. *Veronica gentianoides albocincta*. IV. The *albomarmorata* and *albpulverea* races. V. *Mercurialis annua versicolor* and *xantha*.] Sitzungsber. Preuss. Akad. Wiss. Berlin 6, 7: 212–240. 1920.—III. *Veronica gentianoides albocincta*. This race of *Veronica* appears to be a case of a real white-margined type of variegation. It is self-sterile. When crossed with normal green plants (*typica*) nothing but green plants appeared in  $F_1$  and  $F_2$ , indicating no inheritance of this variegated character. IV. *Albomarmorata* and *albpulverea* races. Both show a white-green spotting or mosaic that is inherited similarly. The spotting of *albpulverea* is much finer than that of *albomarmorata*. 1. *Ipomoea imperialis chlorina* and *albomarmorata*. The following types were isolated from commercial seed and their genetic constitution determined: a. Normal green (*typica homogenea*),  $CCNNHH$ . b. Pale green (*chlorina homogenea*),  $CCnnHH$ . c. White-spotted green (*typica albomarmorata*),  $CCNNhh$ . d. White-spotted pale green (*chlorina albomarmorata*),  $CCnnhh$ . Factor  $C$  produces the *chlorina* pigment; factor  $N$  changes *chlorina* to normal green; and factor  $H$  produces solid leaf color as contrasted with the spotted condition. The latter factor is inherited independently of  $C$  and  $N$ . 2. *Tropaeolum majus chlorinum* and *albpulvereum*. These 2 races of *Tropaeolum* are similar to those of *Ipomoea* noted above. The *chlorinum* type is given the genetic formula  $CCnnHH$  and the *albpulvereum* type, either  $CCNNhh$  (*typica*) or  $CCnnhh$  (*chlorina*). V. *Mercurialis annua versicolor* and *xantha*. The *versicolor* race produces seedlings that begin with yellow leaves which later become green permitting the plant to survive. This character is found to be a simple Mendelian recessive to normal green. In the *xantha* race the seedlings are yellow and remain so, the plant eventually dying. Duplicate factors are concerned in the inheritance, giving both 15:1 and 3:1 ratios of green to yellow seedlings.—E. W. Lindstrom.

1069. COSTANTIN, J. Physiologie de l'anthocyane et chimie de la chlorophylle. [Physiology of anthocyan and chemistry of chlorophyll.] Ann. Sci. Nat. Bot. X, 1: xxxviii–lii. 1919.—See Bot. Absts. 7, Entry 411.

1070. COWGILL, H. B. Cross-pollination of sugar cane. Sugar 21: 580–581. 1919.—Methods used in cross-pollination of sugar cane.—C. W. Edgerton.

1071. DAVENPORT, C. B. Influence of the male on the production of twins. Med. Rec. 1920: 1–10. 1920.—“About 1 per cent of all human births are plural births.” Some mothers have more than one pair of twins and may be called “repeaters.” Such women may be considered to have a constitutional “ovarial structure that readily permits double ovulation,” and such structure is conceivably inheritable. Among the “close relatives of repeating mothers” it is found that “the ratio of twin production rises to 4.5 per cent.” But also among the close relatives of fathers of twins it is found that the incidence of twins is as high as 4.2 per cent, hence “the paternal inheritance is real and nearly as potent as the maternal. The problem is to account for this paternal influence. Double ovulation is not universal in women but “is far commoner, proportionately, than twin births.” A study of pregnant swine shows that the number of corpora lutea exceeds the number of embryos and the latter exceed the number of births. Fetuses die at all stages from no apparent cause but inherent weakness. These facts are apparent in human pregnancies.—Geneticists now recognize “lethal factors,” transmitted according to the laws of heredity, “which brought in by one or

both parental germ-cells, inevitably prevent full development." Besides it must be recognized that there is probably a frequent failure of fertilization of the egg, even when conditions would seem to be propitious. From these considerations it is clear that the father as well as the mother may "determine whether both of a pair of simultaneously ovulated eggs shall be fertilized, and whether or not they shall receive lethal factors." There follow comments on uniovular twins and a plea for more complete and accurate observational data by obstetricians.—*Howard J. Banker.*

1072. DEANE, W., AND M. L. FERNALD. A new albino raspberry. *Rhodora* 22: 112. 1920.—A new amber-white or honey-colored raspberry was found by Mr. ROBERT A. WARE on Caribou Mountains, Maine, in 1919. This is a variant of *Rubus idaeus* var. *canadensis*, and should be called *Rubus idaeus* L. var. *canadensis* Richardson, forma *Warei*. The New England "white"-fruited raspberry already known is a form of *Rubus idaeus* var. *strigosus*. [See also Bot. Absts. 7, Entry 1432.].—*Francena R. Meyer.*

1073. DICKSON, M. E. Elements of higher fecundity. *Michigan Acad. Sci. Ann. Rept.* 21: 145-146. 1919.—Fecundity in fowls is limited chiefly by vitality of individual. Breeding for egg production does not increase vitality. It may even cause decrease of vigor, thereby defeating its purpose. In such cases out-crossing is used to restore vigor and hence to increase production. In selecting for vigor, criteria are size of fowl, early maturity, and rapidity of feathering and moulting. Variety of fowl is of little importance except that meat-producing breeds are to be avoided, evidence of this conclusion coming from egg-laying contests in several states. Environment and general management are more important than breed, since many breeds are about equally productive.—*A. Franklin Shull.*

1074. DONCASTER, L. Note on an experiment dealing with mutation in bacteria. *Proc. Cambridge Phil. Soc.* 19: 269. 1919.—It was noticed that the recorded ratio of occurrences in cases of meningitis of the 4 agglutination-types of *Meningococcus* correspond very closely with the ratio of occurrence of the 4 iso-agglutinin groups of blood in a normal human population.—It seemed possible, therefore, that by growing *Meningococcus* of one type in media containing human blood of different groups, mutation to other types might be induced. Experiment showed that considerable differences in type of agglutination resulted, but it was concluded that this was caused by sorting out of races of different agglutinability from a mass culture rather than by true mutation.—*L. Doncaster.*

1075. FEHLINGER, H. Rassenmässige Variation der Körpergrösse beim Menschen. [Racial variations of body size in man.] *Aus der Natur* 16: 212-215. 1920.

1076. FRUWIRTH, C. Beiträge zu den Grundlagen der Züchtung einiger landwirtschaftlicher Kulturpflanzen. V. Gräser. [Contributions to the fundamental principles of cultivation of several agricultural plants. V. Grasses.] *Naturw. Zeitschr. Forst- u. Landw.* 18: 169-178. 1920.—The present paper supplements a previous article of the author appearing in Vol. 14, 1916, of this publication. He describes further experiments in cross and self-fertilization, and concludes, in general, that among the grasses sterility predominates in self-fertilization and that it is possible to find entire vegetative issues which produce no fruit; then again, that individuality is present, and that individuals and often entire vegetative offspring can be singled out, which produce an appreciable, often plentiful, crop of fruit, as a result of self-fertilization. In the cultural practice, the production of seed by self-fertilization will be more or less difficult, for the probability of securing fruit is not strong, and much of the fruit will be sterile.—*J. Roesser.*

1077. GARBER, R. J. A preliminary note on the inheritance of rust resistance in oats. *Jour. Amer. Soc. Agron.* 13: 41-44. 1921.—Author finds evidence of a single hereditary factor-difference with respect to the rust reaction of the host plants used as parents. Resistance apparently behaves as a dominant character in the crosses made.—*F. M. Schertz.*



1078. GASSER, G. W. Report of the work at Rampart Station. Rept. Alaska Agric. Exp. Sta. 1917: 34-57. Pl. 3, 4. 1919.—Results are given of field tests of varieties, crosses, and pure-line strains of farm and horticultural crops.—[See Bot. Absts. 7, Entry 26.]—*Fred Griffee*.

1079. GLEASON, H. A. [Rev. of: GAGER, C. STUART. *Heredity and evolution in plants*. 14 × 20 cm., xi + 265 p., 113 fig. P. Blakiston's Sons & Co.: Philadelphia, 1920 (see Bot. Absts. 6, Entry 1672).] *Torrey* 21: 14-16. Jan.-Feb., 1921.

1080. GOLDSCHMIDT, RICHARD. Untersuchungen zur Entwicklungsphysiologie des Flügel-musters der Schmetterlinge. I. Mitteilung. Einige Vorstudien. [Investigations of the physiology of the development of the color pattern of the wings in butterflies. I. Some preliminary studies.] Arch. Entwicklungsmech. 47: 1-24. 12 fig. 1920.—This investigation is incidental to author's main work concerning heredity in Lepidoptera. Species used are: *Samia cecropia*, *Teia polyphemus*, *Hyperchirio io*, *Callosamia promethea*, and *Anisota stigma*. Investigations were conducted in the Osborn Zoological Laboratory, Yale University, in 1914-18.—The author points out that blood sinuses develop about tracheae and precede formation of veins. These are centers of chemical processes making for color. Pattern is independent of origin of color and complete before color sets in. Main plan of pattern is due to differential growth of wing surfaces following quickly after development of veins and scales, visible first as irregularities of wing surface, indentations, folds, pits, corners, etc., into which later color is, as it were, poured in. Characteristics of folds, depressions, etc., are due to rigidity of veins, pressure of body upon growing wing, folds in wing membrane in pupal case, etc.—Author suggests various collateral subjects for investigation.—*Isabel McCracken*.

1081. GOLDSCHMIDT, RICHARD. Intersexualität und Geschlechtsbestimmung. [Intersexuality and sex-determination.] Biol. Centralbl. 39: 498-512. 1919.—Chief results of an investigation regarding intersexuality and sex-determination are set forth pending publication of a complete account of the work. The results are founded upon breeding 75,000 individuals of the gypsy moth, *Lymantria dispar* L., involving several varieties. [See next following entry.]—*Isabel McCracken*.

1082. GOLDSCHMIDT, RICHARD. Untersuchungen über Intersexualität. [Investigations on intersexuality.] Zeitschr. Indukt. Abstamm. u. Vererb. 23: 1-199. 2 pl., 84 fig. 1920.—Results are given from rearing about 75,000 individuals of different races of gypsy moth, which are named according to locality: 5 from Germany, 1 from South Europe, 10 from Japan, 1 from Massachusetts. Normal sexes differ in wings (form and color), antennae, abdomen (shape, size, hairiness), gonads, external genitalia, and instincts (flying, mating). Egg plasma or Y chromosome bears a factor, *F*, for female characters which is inherited unchanged in maternal line and is balanced against factor *M* for male characters, which is carried by X chromosome. In pure stock of different races *FMm* is normal female and *FMM* is normal male, for *F* is stronger than 1 dose of *M* and weaker than 2 doses in determining type of development. *F* and *M* differ in strength in different races as shown by crosses. In development of a "genetic" male, *MM* from weak race may be weaker than *F* from strong race. The latter will predominate after a certain "turning point" in development of a particular structure, which from that point on develops as in male. Similarly a "genetic" female, *F* (weak) *M* (strong) *m*, may have "turning point" after which she develops as male. The greater the difference in "strength" of parental races, the earlier this "turning point," and the higher the grade of intersexuality. Last organs to develop in the embryology are the first to be affected. Organs which have a homologue in the other sex develop up to "turning point" as in "genetic" sex and then may dedifferentiate and continue as in the opposite sex. Strong chitinization hinders dedifferentiation. Other organs develop abnormally after "turning point." Instincts become intersexual. Color is determined very late in pupal stage and hence, in "chief type" of female intersexuality, except in those of very low grade, intersexes resemble males. "Gifu type" of female intersexuality and male intersexuality are alike in being streaked with color of opposite sex in greater or less amount according to grade.

Arrangement of streaks apparently depends upon chance, but amount depends upon time remaining after turning point for protein-splitting, color-forming enzymes to act. In streaked type of intersexuality color spreads out from veins, but in "chief type" of female intersexuality from zigzag lines. This difference is not explained. Other differences of color depend upon character of races entering into cross. Mutation *lunata*, which causes zigzag lines to drop out, can be bred pure, and combined with various types of intersexuality. Hormone secretions for sex and secondary sexual characters are probably the same, are produced in each cell, and not in gonads as in vertebrates. Cytology throws no light upon conditions as X and Y are indistinguishable and no difference appears between races. Attempt is made to correlate strength of races with character of environment. Female intersexuality is produced when females of weak races are crossed with males of strong races, giving *F* (weak *M* (strong) *m*). There is but 1 grade of intersexuality from a particular type of cross except for slight overlapping in plus and minus directions. Grades, depending upon races used, are grouped as follows: (a) Beginning: These show some females grading to normal. All are fertile and hence valuable for genetic work. (b) Weak: These are of "Gifu type," always sterile. (c) Medium: Among others are "Aomori type," with large abdomen filled with unused nourishment; embryonal ovaries; hairiness and form of male. (d) Strong: Some are of "chief type," some of "Gifu" according to parentage. (e) Highest grade: These are sterile but grade into (f). (f) Complete "sex-turnabout:" These are apparently normal males, except that a few grade into (e) and there are 9 perfectly normal females to 2187 males. These "extra females" are explained by non-disjunction of sex-chromosomes. Many  $F_2$  and back-cross results are given to corroborate theory of female intersexuality. Intersexual males are usually produced when strong female is crossed with weak male. Fukuoka females by Hokkaido males produce normal females and males varying from apparently normal up to strongly intersexual. Only minus individuals are fertile. (Fukuoka *F*, Hokkaido *M*, *m*) is normal female. (Fukuoka *F*, Fukuoka *M*, Hokkaido *M*) is intersexual male. In later generations it is found that (Fukuoka *F*, Hokkaido *M*, Hokkaido *M*) is female, complete "sex-turnabout." A very few incomplete observations show that after crossing of 2 weak races there may appear male intersexuality. Occurrence of a few "extra males" in crosses where all males should be turned into females is explained by non-disjunction as in case of "extra females."—P. W. Whiting.

1083. GOWEN, J. W. Report of progress on animal husbandry investigations in 1919. Maine Agric. Exp. Sta. Bull. 283. 249–284. 7 fig. 1919.—Logarithmic equations have been determined for yearly yield in milk of the 3 dairy breeds, Holstein-Friesians, Guernseys, and Jerseys. All 3 breeds reach their maximum milk yield when from 8 to 10 years of age.—Sons of various sires have been examined with respect to the sons' ability to transmit high or low milking qualities to their daughters.—A high correlation was found to exist between the milk yield for any 1 lactation period and the average for the first 5. A high correlation also exists between milk production during a 7-day period and the yield during the whole lactation period which either includes the 7 day period or is the one following. On the other hand very little correlation exists between conformation as judged by the score card and milk production.—H. L. Ibsen.

1084. GRIER, N. M. Notes on variation in chicory. Amer. Midland Nat. 6: 148–149. 1919.—Brief note on variation in the number of flowers and involucre bracts of plants of *Cichorium Intybus* growing wild in the Shenandoah Valley, with suggestion that this plant may well be utilized in the laboratory study of variation for classes in biology.—A. B. Stout.

1085. GUNDERSEN, ALFRED. [Rev. of: SMALL, JAMES. The origin and development of the Compositae. 344 p., 40 fig. New Phytologist Reprint No. 11. London, 1919.] Torreyia 20: 125–126. 1 fig. Nov.-Dec., 1920.

1086. HANLY, J. Mendelism and the laws of heredity. Jour. Dept. Agric. Ireland 20: 460–467. 2 fig. 1920.—Popular account and some modern applications.—D. Folsom.



1087. HARRIS, J. ARTHUR, AND C. S. SCOFIELD. **Permanence of differences in the plots of an experimental field.** Jour. Agric. Res. 20: 335-356. 1920.—The fact is generally recognized that heterogeneity is a source of error in experimental field tests. The purpose of the writers is to show whether the differences among experimental plots are permanent or whether they are transitory and are smoothed out by cultivation. Interannual correlations are used as a means of measuring the relative permanency of the differences.—Published data are reviewed for yields of paddy on 17 plots of ranges "B" and "C" of the wet tract of the Experimental Farm at Hebbel, Mysore. The correlation between yields of the same plots for 1905 and 1906 is for range "B"  $+0.834 \pm 0.050$  and for range "C"  $+0.799 \pm 0.059$ . Correlations for yields of ragi on 105 plots of the dry-land experiments of the Mysore state for the years 1905 and 1906, 1905 and 1907, and 1906 and 1907, are  $+0.758 \pm 0.028$ ,  $+0.852 \pm 0.018$ , and  $+0.610 \pm 0.041$ , respectively. Correlations are calculated for yields of corn on the same plots in the years 1895, 1896, and 1897, at the Illinois Experiment Station. Yields of corn in the unfavorable year 1895 correlated with yields of the same plots for the favorable years 1896 and 1897 are  $-0.354 \pm 0.054$  and  $-0.221 \pm 0.059$ , respectively. Yields for the two favorable years 1896 and 1897 show a correlation of  $+0.818 \pm 0.020$ .—Data were taken from the records of the Field Station of the Office of Western Irrigation Agriculture at Huntley, Montana. Yields were used from 46 plots in a uniform cropping experiment covering the period 1909 to 1919 inclusive. The crops involved in the rotation were sugar beets, alfalfa, corn for grain, oats, corn for silage, and barley. In some cases the plots were subdivided into half and quarter plots. Correlations are calculated between yields of the same plots for different years. Of the 152 correlations calculated for whole plots, 133 are positive and 19 are negative. The average value of the positive correlations is  $+0.3346$  as compared with  $-0.1475$  for the negative correlations. For the 152 constants the average value is  $+0.2743$ .—The data from half and quarter plots substantiate the results for whole plots. The results show conclusively that in general plots which yield more in one year will yield more in other years.—Some evidence is given to show the effect of the yield of a particular crop in the rotation upon the yields of subsequent crops. Plots giving high yields of sugar beets in 1911 showed low yields of alfalfa in 1912. Alfalfa exerted a definite residual influence upon subsequent crops. The effect was not fully shown until the 2nd year after the alfalfa field was plowed, and decreased until little if any effect was shown in the 4th year. Due to the residual effect of alfalfa and its early introduction into the rotation it is impossible to determine to what extent the correlations between the yields of alfalfa and the yields of other crops are due to the variation from plot to plot of the amount of nitrogen fixed by the alfalfa and to what extent due to the original heterogeneity of the experimental plots.—*Fred Griffee.*

1088. HENSEN, V. **Die Mutation und was sie über die Entstehung neuer Arten lehrt.** [Mutation and what it teaches about the origin of new species.] Schrift. Naturwiss. Ver. Schleswig-Holstein [Kiel] 17: 1-12. 2 fig. 1920.

1089. HENSEN, V. **Der Vorgang bei der Mutation.** [The process in mutation.] Schrift. Naturwiss. Ver. Schleswig-Holstein [Kiel] 17: 190-191. 1920.

1090. HONING, J. A. **Erfelijkheidsleer zonder Evolutie theoriën.** Rede uitgesproken bij de aanvaarding van het Hoogleeraarsambt aan de Landbouwhoogeschool te Wageningen 23 Nov. 1920. [Genetics vs. theories of evolution. Lecture given on assuming the office of Professor at the Agricultural High School of Wageningen, Nov. 23, 1920.] H. Veenman: Wageningen, 1920.

1091. HONING, J. A. **Selectie-Proeven met Deli-Tabak.** [Selection studies with Deli tobacco.] Teysmannia 30: 1-11. 2 pl. 1919.—To increase production without extending acreage, strains may be sought which produce a large number of leaves per plant. For cigar wrapper-leaf, however, quality is more important than quantity production, hence high leaf number is not given first consideration in selection work. Most types of high leaf number are hybrids which continue to segregate indefinitely. Wrapper leaf should be of sufficient

length and breadth, also ratio of width to length is of some importance. In selection work types with leaves in which width is less than 60 per cent of length are rejected. Leaves 11 to 15, counting from base of plant, were measured. Leaf with broad base is better than one with narrow base. Leaf should be thin but strong, supple, elastic. Light colors are much desired and fallow (vaal) shades are preferred over brown. Red colors are very undesirable. Color and other qualities are affected by soil, weather, and fertilizer, and tobacco harvested in early morning cures a purer fallow (valer) than when harvested later in day. Hence, precautions are required in testing inheritance of color. It appears from extensive tests repeated on different estates that color and fineness of tobacco are hereditary characteristics of the various selections. Results of rigorous comparisons made in 1916 and 1917 with a light-colored and a fallow-colored line, showing percentage yields of the different colors for the leaves on lower half of the plant, are given in tables. On higher-lying soil regularly producing darker tobacco the light-colored strain proved decidedly advantageous while on low lands reddish and spangled colors were obtained in unfavorable weather. Conversely, the fallow line gave better colors on the low lands but a darker product on upland soil. Plants have not yet been found fulfilling the ideal of (1) many leaves; (2) long leaves; (3) broad leaves; (4) broad leaf base; (5) short internodes; (6) thin; (7) strong; (8) supple; (9) light color; (10) tan shade; (11) good burn. "Light line" 1, however, is deficient only as to (1) and (10). Light fallow line 72 produces more leaves and a truer fallow shade than the preceding but has less desirable shape of leaf and longer internodes. [See also following entry.]—*W. W. Garner.*

1092. HONING, J. A. *Selectie-Proeven met Deli-Tabak III.* [Selection experiments with Deli tobacco.] Mededeel. Deli Proefsta. Medan (Sumatra) 2 (no. 6): 25. 1919.—In continuation of previous work (Mededeel. Deli Proefsta. 10: 79-128 and 2d ser., no. 2, 84) critical studies were carried forward with selections, originally obtained from commercial plantings and again propagated in 1918, mainly as to color and length of the fermented leaves taken from the lower half of the plant. In 1918 a total of 357 test plots of 800-1200 plants each, representing 54 lines, with mixed seed as controls, were grown on 12 different estates. With the more promising lines large-scale trials also were made, in some cases more than a million plants being grown. Detailed tabulated data are presented for 13 lines in comparison with mixed seed from which each line was derived, based on 3 primary color grades, with the customary commercial subdivisions of color shades, and the length of leaf. In some instances statistical tables of number of leaves per plant are included. In general, the results of comparisons in 1918 between the selections and mixed seed from which they were derived are in good agreement with those of 1917, showing that the differences in color and length of leaf are hereditary. Some of the selections proved to be segregating hybrids with respect to number of leaves produced. [See also preceding entry.]—*W. W. Garner.*

1093. HOWARD ALBERT, AND G. L. C. HOWARD. Some labour saving devices in plant-breeding. *Agric. Jour. India* 15: 5-10. *Pl. 1.* 1920.—For the prevention of crossing, parchment bags are not suitable in India on account of high temperature and high humidity. Cylindrical muslin covers gave better results with this work. For variety trials a large netted drying house is used, and sheet iron metal cans are used for storing seed which have previously been dried.—*J. J. Skinner.*

1094. HUMPHREY, SETH K. *The racial prospect.* 261 p. Charles Scribner's Sons: New York, 1920.—As stated in the sub-title, this is a "rewriting and expansion of the author's book 'Mankind.'" It is in fact a revised edition of the former work presenting the same fundamental ideas expanded rather than materially modified by the outcome of the war. The racial heritage of the ages accumulated through natural selection tends to be dissipated by civilization; for civilization preserves the defectives and permits their propagation while the best stock becomes increasingly infertile. There follows an inventory of the racial values preserved in the leading nations. Hybridism of extremely diverse races, as in America, is disastrous to the higher race. The struggle for racial dominance lies



between the English-speaking and the German peoples and will be determined by the conservation of the superior stock in the racial heritage. "The deeper current of human affairs knows nothing of the ripples which so constantly fill our excited vision; it runs silently past the hours of the day to meet the centuries, carrying the racially strong through all accidents of war and peace to ultimate world domination." To meet this situation and to counteract the natural tendencies of civilization, Humphreys conceives a nation-wide conscription and registration of all defectives, the segregation of the incompetent in "farm community centres," and the enforced sterilization of "border-liners." But the cutting off of the defective germ-plasm is not sufficient. The infertility of the superior stock would still lead to the dead level of a mediocre race. To meet the need of propagating from the superior breed, a "new motherhood" is conceived. By scientific methods it is considered "possible to gain a distinguished father for one's children as impersonally as one would take inspiration from his books," and thereby the superior celibate womanhood of the race becomes the preserver of the "great inheritance of mankind."—Howard J. Banker.

1095. KLEBAHN, H. *Impfversuche mit Pfropfbastarden*. [Infection experiments with graft hybrids.] *Flora* 11/12: 418-430. 1918.—Tomato is readily susceptible to disease caused by *Septoria lycopersici* and *Cladosporium fulvum*. The black nightshade, *Solanum nigrum*, is resistant to both of these. In this investigation an effort was made to determine the resistance of various graft hybrids of tomato with the black nightshade to these fungi.—Results of infection experiments on the following chimeras, using *Septoria lycopersici*, are given: *Solanum tubingenense*—the outer epidermis is tomato tissue while all the inner tissues are black nightshade. Plant is resistant. *Solanum proteus*—2 outer layers of cells are tomato tissue. Considerable infection was obtained. *Solanum Koelreuterianum*—epidermis, nightshade; interior, tomato tissue. Infection was obtained. *Solanum Gaertnerianum*—2 outer layers, nightshade; interior, tomato. Both positive and negative results were obtained with infection trials. *Solanum Darwinianum*—epidermis, nightshade; center, nightshade; an intervening area, tomato. Infection was obtained. Experiments with *Cladosporium fulvum* were unsatisfactory and will be repeated.—C. L. Porter.

1096. KNIEP, H. [German rev. of: COLLINS, E. J. Sex segregation in the Bryophyta. *Jour. Genetics* 8: 139-146. Pl. 6, 5 fig. June, 1919 (see Bot. Absts. 3, Entry 2103; 5, Entry 1635).] *Zeitschr. Bot.* 12: 685-686. 1920.

1097. LENZ. [German rev. of: NOORDEN, C. VON, UND S. KAMINER. *Krankheiten und Ehe. Darstellung der Beziehungen zwischen Gesundheitsstörungen und Ehegemeinschaft*. (Diseases and wedlock. The relation between ill health and marriage.) 1111 p. Thieme: Leipzig, 1916.] *Arch. Rass.- u. Gesellschaftsbiol.* 13: 208-221. 1918.

1098. LENZ, FRITZ. Oskar Hertwig's Angriff gegen den "Darwinismus" und die Rassenhygiene. [Oskar Hertwig's attack on Darwinism and race hygiene.] *Arch. Rass.- u. Gesellschaftsbiol.* 13: 194-203. 1920.—This is a criticism of Hertwig's whole attitude towards Darwinism and race hygiene, and is directed in particular at his recent pamphlet, "Zur Abwehr des ethischen, des sozialen, des politischen Darwinismus" (Jena, 1918). It is claimed that Hertwig has misconstrued both Darwinism and Lamarckism, and that he has drawn a caricature of race hygiene and the selection theory. His own theory,—a form of determinism depending on a structure and organization of matter by virtue of some inherent "force,"—is held to be philosophically untenable and smacking of the materialistic metaphysics of the 19th century. In the field of ethics, moral value is, according to Hertwig, the directing force; but Lenz maintains with KANT and other philosophers that moral force is outside the world of experience, and that a natural theory which has for its object the laws of "being and becoming," has no application to the principles of values, nor, therefore, of ethics.—L. J. Cole.

1099. LIPSCHÜTZ, A. Bemerkung zur Arbeit von Knud Sand über experimentellen Hermaphroditismus. [Comment on the work of Knud Sand on experimental hermaphroditism.]

Pflüger's Arch. 176: 112. 1919.—Referring to similar work by KNUD SAND on rats, the author points out that he had earlier demonstrated transformation of clitoris into penis-like organ in female guinea-pigs, into which testes had been grafted in place of ovaries.—A. Franklin Shull.

1100. LITTLE, C. C. Is the fertile tortoise-shell tom cat a modified female? Jour. Genetics 10: 301-302. 1920.—Author points out superiority of his non-disjunction hypothesis to DONCASTER's theory of hormone action during embryonic life as an explanation for the production of, and also for the sterility or fertility of, tortoise-shell tom cats.—H. L. Ibsen.

1101. MACBRIDE, E. W. The method of evolution. Scientia 28: 23-33. 1920.—A vigorous attack on the 'mutation theory' of evolution. Since the majority of mutations are recessive in character, and result in 'cripples,' "it seems obvious" to the author "that interesting as the appearance of inheritable potentialities of the mutations are they have nothing to do with the evolution of species and that mutations have not furnished the material for the historical evolution of plants and animals." The Lamarckian doctrine of heritable changes, and consequently of evolution, occurring as the result of use and disuse, in response to needs brought about by environmental change, is then wholeheartedly espoused. The author feels that the experimental work of KAMMERER has not been properly evaluated nor accorded fair treatment by 'Mendelians.' Finally, he stigmatizes as the 'Weismannian nightmare' the idea of a 'germ-plasm' distinct from 'somatoplasm.'—L. J. Cole.

1102. MALAQUIN, A. Reproduction sexuée et reproduction asexuée. [Sexual and asexual reproduction.] Compt. Rend. Acad. Sci. Paris 171: 1403-1406. 1920.—In the annelid family Serpulidae, *Salmacina Dysteri* (Huxley) has sexual and asexual forms which have developed under apparently the same conditions. In 772 individuals there were 93 sexual hemaphrodites, 245 divided or preparing to divide asexually, and 434 unclassified. At the season of sexual activity in the sexually reproducing forms the asexual animals show an increase in size of sex glands and functional activity to almost the normal condition.—D. F. Jones.

1103. METZ, CHARLES W., AND JOSÉ F. NONIDEZ. Spermatogenesis in the fly, *Asilus sericeus* Say. Jour. Exp. Zool. 32: 165-185. 2 pl. 1921.—The spermatogonial chromosomes are 10 in number, arranged in 5 pairs; the sex chromosomes have not been identified. The paired association of chromosomes is retained up to and through the final spermatogonial division. Synapsis is effected in telophase at the beginning of the growth period by the intimate association of chromosomes that were already paired in anaphase, and the union effected at this time persists throughout the succeeding growth period. No leptotene or zygotene stages, in the usual sense, could be found. Tetrad structures are not visible. The 1st maturation division appears to be reductional for all the chromosomes.—Bertram G. Smith.

1104. NACHTSHEIM. [German rev. of: ARMBRUSTER, LUDWIG. Bienenzüchtungskunde. Versuch der Anwendung wissenschaftlicher Vererbungslehren auf die Züchtung eines Nutztieres. (The art of breeding bees. An experiment in the application of scientific genetics to the breeding of a domestic animal.) 22 fig. Th. Fisher: Leipzig and Berlin, 1919.] Biol. Centralbl. 40: 575-576. 1920.

1105. NOACK, KONRAD. [German rev. of: CORRENS, C. Vererbungsversuche mit buntblättrigen Sippen. I. *Capsella bursa-pastoris* albovariabilis und chlorina. (Genetical studies with variegated races. I. *Capsella bursa-pastoris* albovariabilis and chlorina.) Sitzungsber. K. Akad. Wiss. Wien 34: 585-610. 1919 (see Bot. Absts. 4, Entry 551).] Zeitschr. Bot. 12: 675-678. 1920.

1106. NOACK, KONRAD. [German rev. of: CORRENS, C. Vererbungsversuche mit buntblättrigen Sippen. II. Vier neue Typen bunter Periklinalchimären. (Genetical studies with variegated races. II. Four new types of variegated periclinal chimeras.) Sitzungsber. K. Akad. Wiss. Wien 44: 820-857. 1919 (see Bot. Absts. 4, Entry 550).] Zeitschr. Bot. 12: 678-680. 1920.



1107. NOACK, KONRAD. [German rev. of: STOMPS, THEO J. Über zwei Typen von Weissrandbunt bei *Oenothera biennis* L. (On two types of white margins in *Oenothera biennis*.) Zeitschr. Indukt. Abstamm.- u. Vererb. 22: 261-274. 1920 (see Bot. Absts. 8, Entry 1211).] Zeitschr. Bot. 12: 680-682. 1920.

1108. NONIDEZ, JOSÉ F. The internal phenomena of reproduction in *Drosophila*. Biol. Bull. 39: 207-230. 10 fig. 1920.—In spite of the large amount of genetic work with *Drosophila*, heretofore there has been available no description of the morphology and physiology of the internal reproductive organs of the species. This deficiency, which is of considerable importance to those interested in hybridizing experiments, is supplied in the well illustrated description here given. Two points of importance in addition to the purely morphological features are the demonstration that the spermatozoa are retained for several days after copulation in both the spermathecae and the median ventral receptacle, and the suggestion that the spermatozoa are activated by the secretion of the parovaria, certain accessory glands connected with the uterus.—H. H. Plough.

1109. PEARSON, KARL. Notes on the theory of correlation. Biometrika 13: 25-45. 3 fig. 1920.—Pearson traces the early development of the theory of correlation and corrects his earlier "errors of ascription" by giving to GALTON the whole credit of discovering the correlation calculus. The work of GAUSS and of BRAVAIS on the probability curve and the theory of errors is shown to have had a bearing only upon determining the position of indirectly observed points from observed independent variables, mainly in geodesy and astronomy, and although Bravais reached the correlation surface he had not the idea of correlation. Pearson then reviews Galton's early papers on correlation, presents 3 of his figures, and outlines the development and interpretation of his measures of the coefficient of regression. WELDON's papers on correlation in shrimps and crabs, and EDGEWORTH's on "Correlated averages" are briefly reviewed to show that they added almost nothing to the theory.—Henry E. Niles.

1110. RENNER, O. [German rev. of: (1) VRIES, HUGO DE. Mass mutations and twin hybrids of *Oenothera grandiflora* Ait. Bot. Gaz. 65: 377-422. May, 1918 (see Bot. Absts. 1, Entry 219). (2) VRIES, HUGO DE. Phylogenetische und gruppenweise Artbildung. (Phylogenetic and group-wise species formation.) Flora 11-12 (Festschr. E. Stahl): 203-226. 1918 (see Bot. Absts. 5, Entry 349).] Zeitschr. Indukt. Abstamm.- u. Vererb. 24: 175-178. Sept., 1920.

1111. RICHET, C., ET H. CÂRDOT. Mutations brusques dans la formation d'une nouvelle race microbienne. [Sudden mutations in the formation of a new race of microbes.] Compt. Rend. Acad. Sci. Paris 168: 657-663. 1919.—Four months' daily observation of a pure lactic ferment organism in an arsenical medium showed that its essential function,—the formation of lactic acid,—was so developed as to suggest a new race. The formation of this race was not gradual, but sudden; and its developed functions remained stable, not only on the medium in which development took place, but also on other media.—Andrew I. Dawson.

1112. RIDDLE, O., AND H. A. CARR. Posthumous works of Charles Otis Whitman. Carnegie Inst. Washington Publ. 257. Vol. 1.  $x + 194$  p., 88 pl., 36 fig; Vol. 2.  $x + 224$  p., 39 pl., 11 fig.; Vol. 3.  $xi + 161$  p. 1919.—Volume I. The derivation of bars, as shown by *Columbia livia* and domestic races of pigeons, from checks and these in turn from a common avian character, constitutes the main thesis of this volume. This character still persisting in pigeons and other birds, is well preserved in the oriental turtle dove of China. It also occurs in the juvenile plumage of modern pigeons. The check mark of so-called checkers was derived by an apical splitting of the check of the turtle dove until only two spots remained, on the inner and outer vanes respectively, of the feather. By a further modification of these checks bars were derived. Therefore Whitman considers the checker the *affinis* type and the barred the *livia* type. By selection experiments the author was able to reduce the number of checks to 4 bars and then to 3, and so on until a pure gray wing resulted. The process

was, however, irreversible. Whitman concludes that the same law of orthogenesis holds for various other orders of birds. In the latter part of the volume there are 2 chapters on "Fundamental bars and frills" and "The mutation theory and mutations." In the latter, 3 mutations occurring in Whitman's stocks are described.—Volume II contains data relating to many close and wide crosses between doves and pigeons. The main deductions are as follows: The wider the cross the lower the fertility and the greater the tendency for the production of males; fertility is lowest in the autumn with an excess of females and highest in the spring with an excess of males. The stronger germs are produced early and give rise to males, while the later germs are weaker and produce females. Color follows the same law. The appearance of white and certain abnormalities are signs of weakness. There is also a discussion and a presentation of data relating to sex-linkage. About two-thirds of Volume III deals with the behavior relating to reproduction, such as sexual activities, nesting, egg-laying, onset of incubation, and feeding of young. These are discussed in some detail and then related to the variations of different species and the sexes. The other third of the volume is taken up with miscellaneous subjects. The voices of different species are discussed. Certain elements of the voice of the turtle dove are noted in those of the common pigeon. Voices of hybrids are blended. Various other acts of behavior peculiar to pigeons, such as homing, tumbling, and pouting, are considered.—*Sarah V.H. Jones.*

1113. RIXFORD, G. P. Some results of fig breeding by the U. S. Dept. of Agr. Fig and Olive Jour. 4<sup>10</sup>: 12, 13. 1920.—"Fertile seeds can be secured from all kinds of common figs." A branch with pistillate figs about 1-2 cm. in diameter is bagged with a caprifig fruit containing mature *Blastophaga*, and the pollination is left to the insects. Figs containing fertile seeds may differ from unpollination fruits in size, shape, and time of ripening. Hybrids between varieties of the Adriatic class and caprifigs of the Smyrna class are about half caprifigs [staminate]. Several promising seedlings are described.—*Howard B. Frost.*

1114. ROMMEL, GEO. M. Essentials of animal breeding. U. S. Dept. Agric. Farmers' Bull. 1167. 38 p., 32 fig. 1920.—The basic facts about heredity and the breeding of farm animals together with the principles to be followed in livestock improvement are discussed in this bulletin, in popular language.—*Sewall Wright.*

1115. S., E. J. [Rev. of: GAGER, C. STUART. Heredity and evolution in plants. 14 X 20 cm., xi + 265 p., 113 fig. P. Blakiston's Son & Co.: Philadelphia, 1920 (see Bot. Absts. 6, Entry 1672).] Sci. Prog. [London] 15: 498. 1921.

1116. SANDO, CHARLES E., AND H. H. BARTLETT. Rutin, the flavone pigment of *Escholtzia californica* Cham. Jour. Biol. Chem. 41: 495-501. Pl. 6-7. April, 1920.—"The petals of *Escholtzia californica* contain nearly 5 per cent of rutin (quercetin glucosorhamnoside). In view of the great range of (flower) colors in *Escholtzia*, from golden yellow to white, and from white to rose, this genus would appear to afford especially suitable material for study of the physiological and genetic relationships of the flavonol and anthocyanin pigments."—*Leonas L. Burlingame.*

1117. SCHULTZ, WALTHER. Kälteschwärzung eines Säugetieres und ihre allgemeinbiologischen Hinweise. [Blackening by means of cold in a mammal and its general biological implications.] Arch. Entwickl. mech. 47: 43-75. 12 fig. 1920.—Author made experiments on rabbits with pink eyes, white body, and black ears, nose, tail, and feet, to determine the influence of heat and cold on coat color. He was able to change the white color into black and to produce diverse types of hair-color patterns, through the influence of cold. The nature and cause of arctic white and black animals is also discussed.—*John H. Schaffner.*

1118. SEMON, RICHARD. Über das Schlagwort "Lamarckismus." [On the catch word "Lamarckism."] Zeitschr. Indukt. Abstamm.- u. Vererb. 22: 51-52. Dec., 1919.—Author refers to criticisms of H. SIEMENS regarding an article by the author on "The footprint of man," published 5 years ago. Siemens has referred to the article as a Lamarckian expla-



nation and therefore incapable of accounting for phylogenesis. The author replies, however, that no such inference can be drawn and that he has always warned against confusing the catchword "Lamarckism" with the phenomena of somatic inheritance, the interpretation of which can be placed upon a purely physiological basis.—*M. A. Jull.*

1119. SHAFFER, E. L. A comparative study of the chromosomes of *Lachnosterna* (Coleoptera). *Biol. Bull. [Woods Hole]* 38: 83-103. 1920.—The diploid chromosome groups of 4 species of *Lachnosterna* (namely, *delata*, *fusca*, *gracilis*, and *tristis*), as well as *Pelidnota punctata* and *Cotalpa lanigera*, show 20 chromosomes, 1 pair of which is composed of 2 unequal elements (sex chromosomes). There are no essential differences in the form and arrangement of the chromosomes in the species studied. Cyst formation in the testis begins by a rapid division of a single primary spermatogonium, so that all the cells within any particular cyst are the descendants of a single cell. The visible polarity of the cell seems to be established at the time of cyst formation. The growth period of the spermatocytes is marked by the appearance of delicate leptotene threads which are derived from the chromosomes of the last spermatogonial division; these threads become polarized and there is evidence that they are arranged in pairs parasynaptically. There is a definite contraction phase. The sex chromosomes persist through the entire growth period in the form of compact bodies, sometimes being contained within chromosomal vesicles. The unequal sex elements separate in the 1st maturation division and divide equationally in the 2nd maturation division. In the 1st maturation division there are 5 atelomitic tetrads and 5 telomitic tetrads, the latter including the sex pair.—*Bertram G. Smith.*

1120. SLYE, MAUD. The relation of inbreeding to tumor production: studies in the incidence and inheritability of spontaneous tumors in mice. *Jour. Cancer Res.* 1920.—Author states that it is impossible to prove inheritability of any character without inbreeding. Inbreeding reveals what is in a strain, nothing is "increased" or "intensified." Pedigrees are given to show that inbreeding does not increase the incidence of cancer unless selection of the cancer-bearing strains in a mixed population is made.—It is concluded that consistent inbreeding eliminates any strain, and that inbreeding within a cancer strain speedily eliminates the strain and instead of increasing cancer, as some have inferred, it eliminates cancer. Hybridization increases cancer by increasing the output of cancer progeny. Cancer behaves as a recessive. [See *Bot. Absts.* 7, Entry 1727.]—*C. C. Little.*

1121. STOMPS, THEO. J. Über zwei Typen von Weissrandbunt bei *Oenothera biennis* L. [On two types of white variegation in *Oenothera biennis* L.] *Zeitschr. Indukt. Abstamm.-u. Vererb.* 22: 261-274. 1920.—Author presents data bearing upon the heredity, in *Oe. biennis* L., of 2 types of white variegation, as well as evidence for the appearance of these types by mutation, their perpetuation by latent, semi-active, or active genes, and their expression as phenomena of vegetative splitting. The works of CORRENS, BEYERINCK, GREGORY, BAUR, and KÜSTER are discussed at length. In the 1st type of variegation vegetative mutation occurs in the periclinally dividing apical cell producing (1) green twigs and (2) twigs with white-margined leaves. Selfed seed from green twigs give green, from variegated twigs white, and the cross, variegated  $\times$  green, a vegetative splitting into white and green cell complexes, in the  $F_1$ . The latter are piebald variegated identical with types which have arisen by mutation from pure green *Oe. biennis*  $\times$  *Oe. biennis* *cruciata*. In either case such plants are produced by the union of a "green" germ-cell with one mutated to "white." The results of selfing green, nearly green, variegated, and strongly variegated twigs of the piebald-variegated plants warrant the conclusion that each cell complex has reached a definitive condition which may be transmitted to its offspring. The following types fall in the piebald variegated class: *Mirabilis jalapa albomaculata* and *Arabis pallida pseudoleucodermis*, studied by Correns, *Pelargonium zonale albomarginatum* and *Antirrhinum majus albomaculatum*, by Baur, and an *albomaculata* type of *Primula sinensis* reported by Gregory. In all of these types the chlorophyll factor is carried over in a perlabile condition. In *Mirabilis jalapa*, reciprocal crosses, *albomaculata*  $\times$  normal green, Correns and Baur report con-

flicting results, Correns finding strict matrocliny and Baur the production of piebald variegated plants as well as white and green. The mutation coefficient, "green" to "white," is 0.01 per cent, such mutations probably occurring in the somatic cells before the flower appears. Three methods are possible, (1) vegetative mutation, (2) mutation in the gametes, and (3) the appearance of variegation as an intermediate character between 2 races. The latter possibility is illustrated by the author's 2nd type of variegation. A plant of this type appeared by mutation in 1918. Selfed green twigs, variegated twigs, the cross, variegated  $\times$  green, and the cross, variegated  $\times$  a constant *chlorina* type from *Oe. suaveolens*  $\times$  *Oe. Hookeri*, all gave green progeny, the latter heterozygous for a chlorophyll factor. This type constitutes an intermediate race. Its characters in so far as they may be called specific are designated by the writer as "taxonomic anomalies."—Corren's hypothesis that white variegation is due to a disease condition is summarily dismissed and the alternative hypothesis of a special condition of the gene for the development of chlorophyll for each cell complex, advanced. The white sub-epidermal layer in Corren's *Arabis pallida pseudoleucodermis*, for instance, appears as the expression of a semi-latent gene for normal green pigment.—In closing the author says, "*La vérité est en marche; rien ne l'arrêtera.*" [See also Bot. Absts. 8, Entry 1107.]—*Paul A. Warren.*

1122. TISCHLER, G. [German rev. of: FLORIN, RUDOLF. *Zur Kenntnis der Fertilität und partiellen Sterilität des Pollens bei Apfel und Birnensorten.* (On the fertility and partial sterility of the pollen of different varieties of apples and pears.) *Acta Horti Bergiani* 7: 1-39. 1920 (see Bot. Absts. 5, Entry 1503).] *Zeitschr. Bot.* 12: 687-688. 1920.

1123. VAN DENBURGH, JOHN. A further study of variation in the gopher snakes of western North America. *Proc. California Acad. Sci.* 10: 1-27. 2 pl. 1920.—A study of the variations of number of gastroteges, dorsal color pattern blotches, and scale rows has revealed the existence of 7 geographical races of the western North American gopher snakes, *Pituophis*. On the basis of number of gastroteges 2 subspecies were formerly recognized. Those having the lower number, *P. cantenifer cantenifer*, occur in the cool northern coast and adjacent interior regions extending to middle California. The number of gastroteges increases in the southern regions where is found *P. c. annectens*. Within these subspecies geographic variation in color pattern exists, the coast forms having a higher number of blotches than the interior forms; *P. c. heermanni* is the northern interior form having fewer color blotches than the coast form of the same latitude. The same distinction is found between coast and interior forms of the southern group. The interior form here is designated *P. c. deserticola*. The number of scale rows also shows geographical variation permitting a further subdivision. The northern and southern divisions named above fall into 2 groups while the snakes of Lower California, Utah (*rutilis*), and Arizona (*stejnegeri*) form 3 different groups, the latter 2 being subspecies, that of Lower California a true species, *P. vertebralis*. The author has thus divided 3 groups into 7 on the basis of geographic variation of at least 3 characters. A key for the identification of the 7 groups is given.—*J. L. Collins.*

1124. VRIES, EVA DE. Versuche über die Frucht- und Samenbildung bei Artkreuzungen in der Gattung *Primula*. [Study on fruit and seed formation in species crosses of the genus *Primula*.] *Rec. Trav. Bot. Néerland.* 16: 63-205. 1919.—Study in detail on seed and fruit formation in species crosses between *Primula acaulis*, *P. Sibthorpii*, *P. elatior*, *P. Juliae*, *P. Auricula*, and *P. hirsuta* with special reference to self and cross-pollination as related to heterostylism. Short-style  $\times$  short-style and long-style  $\times$  long-style represent illegitimate unions in author's classification, while long-style  $\times$  short-style and its reciprocal are designated legitimate. Illegitimate unions are of two kinds—those from selfing and those derived from crossing plants of either the same or of different species, but with the same type of style. When protected against insects, there is no self-pollination in *P. acaulis*. In profuse-flowering stocks of *P. elatior*, spontaneous selfing takes place in short-style, but very rarely in long-style plants. Artificial self-pollination in case of *P. acaulis* and *P. elatior* give different results with the two style types. Long-style *P. acaulis* gave about 25 per cent fruits as



against less than 1 per cent fruit in short-style selfings (159 pollinations gave one fruit). Fruits in both cases have good seed. Results in *P. elatior* somewhat similar. Illegitimate pollinations of long-style *P. acaulis*  $\times$  long-style *P. elatior* gave no results. Illegitimate pollinations of *P. Sibthorpii*  $\times$  *P. elatior* and of *P. Auricula* gave only negative results. Legitimate unions in *P. acaulis*, *P. acaulis*  $\times$  *P. Sibthorpii*, and reciprocals fruit readily and seed is similar in all in number, size, and weight.  $F_1$  *P. acaulis*  $\times$  *P. Sibthorpii* is fertile and crosses back with either parent. Legitimate unions of *P. acaulis*  $\times$  *P. elatior* are more difficult to secure than legitimate unions between plants of *P. acaulis*, but less difficult than illegitimate unions. Fruit and seed in general are very small and seed weight at most half that of seed of pure species. Reciprocal (*P. elatior*  $\times$  *P. acaulis*) in legitimate cross-pollination sets fruits readily and gives 50–60 per cent very large seed, and remainder very light. Legitimate cross-pollination of *P. acaulis* by *P. Juliae* produces fruit as readily as legitimate unions in *P. acaulis*, but seeds, though equal in number, are lighter and smaller.  $F_1$  hybrids are fertile.  $F_1$  back-crossed with parents in legitimate unions gave seed as large and numerous as in *P. acaulis*. *P. elatior* fruits readily in legitimate cross-pollination. Legitimate cross-pollination of *P. elatior* by *P. Sibthorpii* gives results similar to *P. elatior*  $\times$  *P. acaulis*. Reciprocal crosses (12) gave only one fruit with very small seeds. Long-style *P. elatior*  $\times$  *P. Juliae* short-style, fruited and seeded as readily as pure *P. elatior* in legitimate unions.  $F_1$  hybrids are fertile in legitimate unions. Both style-forms of *P. Auricula* in legitimate unions set fruit readily. Legitimate crosses of *P. Auricula* by *P. hirsuta* and reciprocal set easily. Legitimate crosses between plants of *P. hirsuta* are fertile. Seeds of *P. Auricula*, *P. hirsuta* and their hybrids from legitimate unions are indistinguishable. Literature on the subject is reviewed.—Orland E. White.

1125. WHITE, WILLIAM A. [Rev. of: KNIGHT, M. M., IVA, L. PETERS, AND PHYLLIS BLANCHARD. *Taboo and genetics*. 301 p. Moffat, Yard and Co.: New York, 1920.] *Mental Hygiene* 5: 194–195. 1921.

1126. WRIGHT, SEWALL. The relative importance of heredity and environment in determining the piebald pattern of guinea-pigs. *Proc. Nation. Acad. Sci. [U. S.]* 6: 320–332. 6 fig. June, 1920.—Correlation between parents and offspring was found to be  $+0.211 \pm 0.015$  for random-bred stock with piebald pattern, while it was found to be only  $+0.014 \pm 0.022$  for stock inbred for many generations. Variability in inbred stock is thought to be due almost entirely to irregularity in development. By biometrical methods it has been determined that for the random-bred stock "variations in pattern are determined about 42 per cent by heredity, and 58 per cent by irregularity in development, leaving nothing for tangible environmental factors. In the inbred family the corresponding figures are 3 per cent for heredity, 5 per cent for tangible environment, and 92 per cent for irregularity in development."—H. L. Ibsen.

1127. YAMPOLSKY, CECIL. Sex intergradation in the flowers of *Mercurialis annua*. *Amer. Jour. Bot.* 7: 95–100. 1 pl. Mar., 1920.—Typical flowers for male, female, and monoecious forms in this species are described, and various grades of hermaphrodite flowers are described and figured for both female and monoecious forms. These develop in various grades of maleness along with complete femaleness, or in various gradations in the proportion of the two, with in many cases no loss of functioning power of the organs formed. "Most elaborate and varied transition stages appeared of stamens into pistils and of pistils into stamens." "Intergradations within the flowers may occur by steps that are almost insensible." A periodic alteration of sex is reported for monoecious plants.—It is pointed out that a factorial hypothesis of sex determination does not explain these results; that no definite factor determines the sex of a flower, but that sex is here an epigenetic condition.—A. B. Stout.

## HORTICULTURE

J. H. GOURLEY, *Editor*H. E. KNOWLTON, *Assistant Editor*

(See also in this issue Entries 771, 838, 866, 888, 915, 1058, 1060, 1078, 1087, 1113, 1122, 1346, 1388, 1396, 1420, 1446, 1457, 1499, 1513, 1523, 1525)

## FRUIT AND GENERAL HORTICULTURE

1128. ALBERT, C. Utilisation des serres sans chauffage au charbon, ni fumier. [Utilization of greenhouses without heat from coal or manure.] *Revue Hort.* 92: 166-167. 1920.

1129. ANONYMOUS. Grafting of walnut trees. *Amer. Nut Jour.* 10: 12. 1919.—Discussion by members of the Western Walnut Growers Association. When grafting is done low down on the ground the graft will start and then die. Hence better results are obtained from trees grafted some distance above the ground. It was found that fine crops may be obtained when the grafting is carried out 12 feet above the surface of the ground.—*E. L. Overholser.*

1130. ANONYMOUS. Making lime-sulphur at home. *British Columbia Dept. Agric. Circ. New Hort. Ser.* 61. 5 p. 1920.

1131. ANONYMOUS. [Rev. of: GOULD, H. P. *Peach-growing.* xxi + 426 p. The Macmillan Co.: New York, 1918.] *Sci. Prog.* [London] 15: 147. 1920.

1132. ANONYMOUS. [Rev. of: HEDRICK, U. P. *Manual of American grape-growing.* xiii + 458 p. The Macmillan Co.: New York, 1919.] *Sci. Prog.* [London] 15: 147-148. 1920.

1133. BIOLETTI, T. FREDERIC. Propagation of vines. *Univ. California Agric. Exp. Sta. Circ.* 225. 4 p. 1920.—Directions for the propagation of vines are discussed under the following heads: (1) Choice of cuttings; the best wood for cuttings is of medium size and with moderately short joints. (2) Time of making cuttings; best to make the cuttings as soon as possible after the vines are pruned. (3) Method of making cuttings; cuttings  $\frac{1}{2}$ – $\frac{3}{4}$  inch in diameter are best and not more than 1 inch at the butt or less than  $\frac{1}{4}$  inch at the top; the shorter the better, providing they can be made to root. (4) Care of cuttings; discussion of methods of handling cuttings. (5) Planting of cuttings, including field practices. (6) Digging and care of rooted vines.—*A. R. C. Haas.*

1134. BONVALLET, E. Radis noir Poids d'horloge, sa culture. [The culture of the black radish, Poids d'horloge.] *Revue Hort.* 92: 164. *Fig. 57.* 1920.—This is one of the best winter radishes of commercial importance. It requires careful selection to maintain it at a high standard of quality. The seeds are planted from the end of May to the end of July.—*E. J. Kraus.*

1135. BULLARD, W. P. National Pecan Growers' Exchange. *Amer. Nut Jour.* 10: 55-56. 1919.—The co-operation marketing of this exchange has centralized control, efficiently standardized grade and brand, and has stabilized market. Distribution has been effected with scientific precision, and the speculator's net profit becomes distributed to the growers as extra profit.—*E. L. Overholser.*

1136. BURNS, W. The top-working of Indian fruit trees. *Agric. Jour. India* 15: 516. 1920.

1137. CHEVALIER, AUG. Sur les variations de bourgeons des arbres et arbustes cultivés comme de décadence des variétés anciennes. [On bud-variations of trees and cultivated shrubs as a cause of the degeneration of old varieties.] *Compt. Rend. Acad. Sci. Paris* 171:



1011-1014. 1920.—It is contended that bud-variations are the cause of varieties "running out." Examples are given from the citrus fruits as well as from the apple, pear, olive, and cherry. Mention is also made of *Myrtus communis* and *Acer negundo* var. *folis argentic variegatus*. It is therefore concluded that sexual reproduction at intervals is advisable in horticultural varieties.—C. H. Farr.

1138. CONDIT, I. J. **The fig in the Sacramento valley.** Monthly Bull. Dept. Agric. California 8: 591-595. 1919.—The following are the 4 varieties of figs chiefly grown commercially in California: Mission, Adriatic, Smyrna, and Kadota. The Smyrna, although of better quality than the Adriatic, is more exacting as regards climate and soil requirements, and although yielding a better dried product is not as good a shipper as the Kadota. For Sacramento valley the author recommends the Black Mission, which is an excellent variety for commercial planting on account of the quality, and the certainty and size of its crop.—E. L. Overholser.

1139. CRAFTS, H. A. **Cover crops for our orchards.** Sci. Amer. 123: 567, 582-583. 1 fig. 1920.

1140. CROW, J. W. **Biennial fruitbearing in the apple.** Sci. Agric. [Canada] 1: 39-40. 1921.—Biennial bearing is not a fixed characteristic of Duchess and Wealthy varieties. Growths of spurs are classified according to length, those from 4 to 9 mm. bearing nearly all the fruit. To secure annual fruiting it is necessary to stimulate growth of the tree in the non-bearing year. Experiments at Ontario Agricultural College indicate that this is accomplished by moderate heading back of small branches in the non-bearing year, and by applying nitrate of soda in the early spring. Observations show that 75 per cent of fruit spurs on these varieties have completed their growth for the season by the time the first blossoms have well set.—B. T. Dickson.

1141. DANIEL, LUCIEN. **Recherches sur la greffe des Solanum.** [Investigations of the grafts of Solanum.] Compt. Rend. Acad. Sci. Paris 171: 1074-1076. 1920.—A study of grafts of potato on tomato and on mad-apple. Some of the characters of the stock, such as delay in maturing of the fruits, are imparted to the scion, thus making a situation similar to that in grafts of *Vitis vinifera* on *V. rupestris*. These new characters are transferred by asexual propagation. The tomato used as a stock is also found to affect the nature of the fruit of the mad-apple.—C. H. Farr.

1142. DORRIS, G. **Establishing the filbert grove.** Amer. Nut Jour. 10: 34-35. 1919.—Soil must be retentive of moisture,—river bottom soil is best. As filbert blooms and pollinates in mid-winter, location requires no consideration as to frost conditions. The Davidiana is the best pollenizer for most varieties. Each year's growth is to be cut back about 2 feet; should not head higher than 2 feet,—preferably 1 foot.—E. L. Overholser.

1143. ENFER, V. **Utilization des serres sans chauffage: production des légumes.** [Utilizing greenhouses without heat: growing vegetables.] Revue Hort. 92: 179-180. 1920.—The specific crops and varieties most suitable for culture in greenhouses without artificial heat, together with the directions for planting and culture of the same, are given.—E. J. Kraus.

1144. ESTEBAN DE FAURA, ANTONIO. **Cultivo del olivo.** [Cultivation of the olive.] El Agricultor [Santiago, Chile] 5: 123-126. 3 fig. 1920.—Reprinted from La Hacienda.—J. A. Stevenson.

1145. GARDNER, V. R. **Bud selection with special reference to the apple and strawberry.** Missouri Agric. Exp. Sta. Res. Bull. 39. 27 p. 1920.—See Bot. Absts. 3, Entry 1155.

1146. GAVILÁN, JUAN. **Producción y cultivo de plátanos.** [Production and cultivation of bananas.] Informacion Agric. [Madrid] 11: 1-2. 1 fig. 1921.—The banana industry of the Canary Islands is discussed.—John A. Stevenson.

1147. HAWKINS, LON A., AND J. R. MAGNESS. Some changes in Florida grapefruit in storage. Jour. Agric. Res. 20: 357-373. 1920 [1921].—Determinations of percentages of sugars, acids, dry matter, shrinkage of fruit, peel and the thickness of peel of grapefruit (*Citrus decumana*) when stored at 32, 36, 40, 55  $\pm$  5, 70, and 86° F. are reported. The fruit keeps longer at low temperatures, decay is reduced, shrinkage is less, and physiological processes are retarded. Fruit stored at 40° F. or below shows an undesirable pitting of the peel. Sunken spots appear which become 1-2 mm. in diameter and brown in color. The pit does not extend into the fruit and the flavor is unaffected. Most pitting occurred at 40° F., and none was observed at the higher temperatures. Flavor of the fruit improves in cold storage, but this improvement is more rapid at higher temperatures. The titratable acids in the fruit decrease after the fruit is removed from the tree and placed in cold storage. There is an apparent increase in sugar content in cold storage. Shrinkage is from 5 to 8 per cent in cold storage and about 23 per cent in warm ventilated storage.—D. Reddick.

1148. HOY, B. Orchard cover-crops. British Columbia Dept. Agric. Circ. New Hort. Ser. 51. 6 p., 3 fig. 1919.

1149. HOY, B. Selection of orchard sites and soils. British Columbia Dept. Agric. Circ. New Hort. Ser. 53. 7 p., 2 fig. 1919.

1150. HOY, B., AND H. H. EVANS. Pruning fruit-trees. British Columbia Dept. Agric. Circ. New Hort. Ser. 60. 20 p., 21 fig. 1920.

1151. LECOLIER, P. Un mode de greffage à préconiser; la greffe anglaise appliquée au cerisier. [A noteworthy method of grafting; the splice-graft used on the cherry tree.] Revue Hort. 92: 161-162. 1920.—The cions, of approximately the same diameter as the top of the tree to be grafted, are set in place during September, preferably the latter half of the month. After tying, a light protection of wax is advantageous. The following spring and summer the new growths may be pinched back to cause a more profuse branching of the top and the trees may be sold the autumn of the same year. The method is applicable to other stone fruits, and to apples and pears though these develop more slowly when the lateral branches are suppressed.—E. J. Kraus.

1152. LINDEN, VAN DER, J. G. HAZELOOP, EN N. VAN POETEREN. Proefneming met rook, ter bescherming van gewassen tegen nachtvorsten. [Experiments with smoke, for protection of plants against night frosts.] Mededeel. Phytopath. Dienst Wageningen 15. 22 p., pl. 1-4. 1920.—By burning fuel which develops much smoke or soot the temperature can be increased considerably over large areas. The rise of temperature is due mainly to decreased radiation from the soil on account of the cover of smoke. Direct heating of the air also takes place. Smudging of small areas from the windward side is not advisable as there is no certainty that the smoke will sufficiently cover a certain area. Peat saturated with crude naphthaline is very useful, giving much smoke and heat.—The cost per 2½ acres (1 Ha.) of raising the temperature 1°C. for 1 hour is from 40 to 50 gulden (\$16 to \$20).—The experiments were carried out in Amersfoort and Elst.—J. C. Th. Uphof.

1153. MOREL, F. Remarque sur la culture du Pêcher. [Note on peach culture.] Revue Hort. 92: 178. 1920.—Peach trees when grown against walls are generally set either on the east or south face. When it becomes necessary to replace such plantings the new trees may be set on the west or north face and the tops of the trees drawn through holes in the wall to the opposite, more desirable, exposure.—E. J. Kraus.

1154. MORRIS, O. M. Prune growing in western Washington. Washington [State] Agric. Exp. Sta. Popular Bull. 120. 21 p., fig. 1-7. 1920.—Attention is given to varieties, pruning, cultivation, and fertilizer trials. The fertilizer trials indicated that nitrogen is the element most frequently deficient in the prune orchards of Clark County. Other factors causing crop failure are unfavorable weather at blossoming time and the brown-rot.—F. D. Heald.



1155. MORRIS, ROBERT T. **Comment.** [Rev. of: KNIGHT, F. A. *Propagation of the walnut.* Trans. Hort. Soc. London 3: 133. 1918.] Amer. Nut Jour. 11: 20-21. 1919.—Critical comments on F. A. Knight's "Propagation of the walnut."—*E. L. Overholser.*

1156. MUNSON, K. W., AND E. W. WHITE. **Loganberry culture.** British Columbia Dept. Agric. Circ. New Hort. Ser. 54. 23 p., 10 fig. 1920.

1157. MUNSON, K. W., AND E. W. WHITE. **Raspberry culture.** British Columbia Dept. Agric. Circ. New Hort. Ser. 55. 15 p., 7 fig. 1920.

1158. NANOT, JULES. **Reconstitution des plantations fruitières dans les régions libérées et évaluation des dommages causées aux arbres.** [Restoration of orchards in the liberated regions with an estimate of the damage done to the trees.] 84 p., 50 fig. Miason: Paris, 1920.

1159. ORB, G. **The story of the prune.** Sci. Amer. 124: 52. 3 fig. 1921.

1160. PRAY, LUIS. **Plantemos frutillares industriales.** [Commercial strawberry plantings.] El. Agricultor [Santiago, Chile] 5: 5-7. 2 fig. 1920.

1161. PRAYAG, S. H. **The influence of stock and scion and their relation to one another.** Agric. Jour. India 15: 533-542. 3 fig. 1920.—Some stocks have a distinct preference for particular scions while others do not. The stock plays an important part in influencing the habit of growth and hardiness of the scion. The formation, at the point of union, of big knotty excrescences in plants whose rate of growth is not similar, considerably checks growth. Grafted plants composed of parts having different periods of rest fail to grow into big plants. The scion has a preponderating influence in determining the character of the fruit produced by it. The position of the mature scion at the end of a branch in a large tree influences the flowering. It is undesirable to insert scions of more than one variety on the branches of a single stock. Grafting between different genera, though succeeding in some cases, has not been found successful in the mango.—*J. J. Skinner.*

1162. RINGELMANN, M. **Chauffage des serres au bois.** [Heating greenhouses with wood.] Revue Hort. 92: 180-181. Fig. 62-63. 1920.—A method is detailed of making and fitting special grates for the burning of wood in furnaces intended for the use of coal.—*E. J. Kraus.*

1163. RIVIÈRE, GUSTAVE, ET GABRIEL BAILHACHE. **Observations sur la composition de l'atmosphère d'un fruitier dans lequel on conserve des pommes de Caville Blanc.** [Observations on the composition of the atmosphere of a fruit store where apples are kept.] Jour. Soc. Nation. Hort. France 21: 151-153, 202-204, 234-235. 1920.—The writers state that after apples are mature, during the period they are kept in the fruit store or storage room, they lose their green color, and, due to chemical reactions in the apple itself, they give off CO<sub>2</sub> and take in oxygen whether they be in the light or in partial or total darkness. Due to this giving off of CO<sub>2</sub> the atmosphere in the fruit store becomes considerably modified and it is the belief of the writers that this must have some effect on the fruit itself. Analyses were made of the air of a fruit storage room and it was found to contain a large amount of CO<sub>2</sub>. The writers conclude that CO<sub>2</sub> must be an important factor in the keeping of fruits, since in experiments with pears, covering several years small quantities of CO<sub>2</sub> retarded maturity and arrested it completely when in excess. Results are given of temperature and humidity studies in a fruit storage room. When the temperature was the highest, 10°C., the humidity was also the highest, 94 per cent of saturation. At the lowest temperature, 2°C., the humidity was 88. It is stated that this high humidity probably accounts for apples keeping for a long time with only a slight withering or wrinkling of the skin. The writers conclude that the temperature ought to be maintained between 2 and 4°C., and add that this can be accomplished only under refrigeration.—*H. C. Thompson.*

1164. ROBERTSON, W. H. **Currant and gooseberry culture.** British Columbia Dept. Agric. Circ. New Hort. Ser. 61. 2 p. 1921.

1165. SHRIVASTAVA, K. P. A preliminary note on the improvement of oranges. *Agric. Jour. India* 15: 508-515. 6 fig. 1920.—A general discussion is given of pruning, irrigation, and manuring. Experiments are being made with organic manures and mineral fertilizers. There is a distinct improvement in the vegetation, growth, and fruiting of the trees resulting from the use of nitrogenous manures. Mohwa (*Bassia latifolia*) refuse is producing best results, followed by castor cake, cattle dung, and calcium nitrate. The mineral fertilizers have as yet produced no noticeable effect.—J. J. Skinner.

1166. SIEBERT, A. Kriegswirtschaftliche Betätigung des Palmengartens. [Cooperation of the Palm Garden in war activities.] *Ber. Senckenberg. Naturf. Ges. Frankfurt a. M.* 49: 83-84. 1919.—The activities of the Palm Garden at Frankfurt in helping to increase the production of vegetable foods in Germany are here reported. The propagation of potatoes by means of cutting is described, and the cultivation of certain vegetables which had previously been imported has proved practicable.—A. W. Evans.

1167. SKERRETT, R. G. California's citrus fruit industry. *Sci. Amer. Monthly* 2: 212-216. 11 fig. 1920.

1168. WEST, FRANK L., AND N. E. EDLEFSEN. Freezing of fruit buds. *Jour. Agric. Res.* 20: 655-662. Pl. 75. 1921.—Thermometers were hung in tree tops and temperature records kept for all spring nights with freezing temperatures. Flowers were also frozen in chambers and records kept. Tables are given showing the percentage of blossoms of different ages killed by different temperatures.—W. H. Chandler.

## FLORICULTURE AND ORNAMENTAL HORTICULTURE

1169. ANONYMOUS. A new *Polygonum*. *Florists' Exchange* 50: 1017. 1920.—*P. campanulatum* attracted much attention and received an award of merit when recently shown in London. It is a plant of bushy growth, 2½ ft. high, with distinctly bell-like flowers, and colored much like *Kalmia latifolia*. It is probably a plant of great promise, a possible acquisition for pot work.—L. A. Minns.

1170. ANONYMOUS. *Eupatoriums* as a florists' flower. *Florists' Exchange* 50: 873. 1920.—Note is made of the use of a *Eupatorium* in one of the florists' stores of Boston. The writer then lists useful *Eupatoriums* for garden and greenhouse, some of which are little known and seldom seen. The list includes, of hardy herbaceous kinds, *E. perfoliatum*, *E. agertoides*, and *E. Fraseri*, all white, and *E. coelestinum*, one of the best blue perennials; while for growing under glass there are *E. Purpusi*, sweetscented, pink, and *E. conspicuum*, shrub-like, a good winter bloomer and summer bedder.—L. A. Minns.

1171. ANONYMOUS. New plants. *Florists' Exchange* 50: 863. 1920.—Attention is called to new plants recently exhibited in London, among which were several named varieties of hardy asters; *Helianthus*, "Monarch," of the *rigidus* section, having 3 or 4 rows of ray florets and described as magnificent; and a new *Dahlia*, "Ada Finch," described as clematis-flowered in form.—L. A. Minns.

1172. BAUER, G. *Le Leontopodium alpinum* Cass; culture sur rocailles. [The culture of *Leontopodium alpinum* Cass., in rockeries.] *Revue Hort.* 92: 165-166. Fig. 58-59. 1920.

1173. BELLAIR, G.-A. ET P. Parcs et jardins. [Parks and gardens.] 382 p., 226 fig. J.-B. Baillière et Fils: Paris, 1919.

1174. BOYNTON, KENNETH R. *Eupatorium coelestinum*. *Addisonia* 4: 39-40. Pl. 140 (colored). 1919.—*Eupatorium coelestinum* L. is illustrated and redescribed. The species is a native of eastern U. S. A. and Cuba.—T. J. Fitzpatrick.



1175. BOYNTON, KENNETH R. *Sedum spectabile*. Addisonia 4: 3. Pl. 122 (colored). 1919.—This showy *Sedum*, first characterized by Boreau in 1866, although propagated by horticulturists since about 1860, is described. The presumed nativity is Japan.—T. J. Fitzpatrick.

1176. BROWN, W. ROBERTSON. The frash (*Tamarix articulata*). Agric. Jour. India 14: 758-761. Pl. 2. 1919.—The article discusses the use of the "Frash" as a windbreak, or as a hedge for dividing estates, etc. The tree is well depicted in the illustrations.—J. J. Skinner.

1177. KÖCK, G. Vergleichende Bodentemperaturmessungen. [Comparative soil-temperature measurements.] Zeitschr. Landw. Versuchsw. Deutschösterreich 23: 69-87. 1920.—Comparative soil temperatures were taken at a depth of 30 cm. near the north, south, east, and west walls of a trellis garden. The walls were 2 meters high and peach trees had been trained against them. Temperatures were taken each day at 7 a.m., 12 m. and 6 p.m. for 1 year. Average daily and monthly temperatures, maxima, minima, etc., are given. Air temperatures were also taken for comparison. Taking the whole year into consideration the warmest situation for trellis-plants would be the south side of the wall, the east, north, and west sides following in the order named. From a temperature standpoint, the north and west situations are closely related as also are the east and south situations. Especially in December, January, and February does the north side surpass the south and east sides in temperature, and it is also considerably higher than the west side. In the other months, the west side is somewhat higher in temperature than the north side and the south and east sides surpass both.—John W. Roberts.

1178. MACKENZIE, KENNETH K. *Eupatorium maculatum* L. Addisonia 4: 23-24. Pl. 132 (colored). 1919.—The author gives a description, with notes, of this the most conspicuous of the joe-pye weeds, a native of northeastern North America.—T. J. Fitzpatrick.

1179. NASH, GEORGE V. *Celastrus articulatus* Thunb. Addisonia 4: 9-10. Pl. 125 (colored). 1919.—A hardy, shrubby bittersweet, native of China and Japan, frequently cultivated, rather closely related to *Celastrus scandens* of the United States.—T. J. Fitzpatrick.

1180. NASH, GEORGE V. *Crataegus macrosperma*. Addisonia 4: 35. Pl. 133 (colored). 1919.—A variable species, ranging throughout northeastern United States and Nova Scotia.—T. J. Fitzpatrick.

1181. NASH, GEORGE V. *Crataegus succulenta*. Addisonia 4: 5-6. Pl. 123 (colored). 1919.—A species of the macracanthae group, native of Nova Scotia and northeastern United States, possessing economic possibilities.—T. J. Fitzpatrick.

1182. NASH, GEORGE V. *Forsythia Fortunei*. Addisonia 4: 17-18. Pl. 129 (colored). 1919.—An early blooming shrub of the olive family, a native of China, frequent in cultivation.—T. J. Fitzpatrick.

1183. NASH, GEORGE V. *Malus Halliana*. Addisonia 4: 27. Pl. 134 (colored). 1919.—A decorative shrub, native of western China, introduced into the United States in about 1863, by Dr. G. R. Hall.—T. J. Fitzpatrick.

1184. NASH, GEORGE V. *Oxydendrum arboreum*. Addisonia 4: 37-38. Pl. 139 (colored). 1919.—A species of the monotypic genus, native of southeastern United States, introduced into England and elsewhere.—T. J. Fitzpatrick.

1185. PARTINGTON, J. B. Rose culture. British Columbia Dept. Agric. Circ. New Hort. Ser. 59. 5 p., 2 fig. 1920.

1186. PENNELL, FRANCIS W. *Penstemon calycosus*. Addisonia 4: 31-32. Pl. 136 (colored). 1919.—A showy species, growing on shaded calcareous soil, native of the southeastern Mississippi Valley.—T. J. Fitzpatrick.

1187. PENNELL, FRANCIS W. *Penstemon digitalis*. Addisonia 4: 19-20. Pl. 130 (colored). 1919.—A lengthy description of the species is given, with comments on the genus. The species is a native of southwestern Mississippi Valley, introduced eastward.—T. J. Fitzpatrick.

1188. PROSCHOWSKY, A. R. *Albizzia lophanta* Benth., var. *speciosa*. Revue Hort. 92: 174-175. 1920.—A beautiful tree of rapid growth, readily propagated from seed and well adapted to dry situations, this plant should be grown abundantly as a decorative perennial in the milder climates and as an annual in the more northern localities.—E. J. Kraus.

1189. ROLET, A. *Le froid artificiel régulateur des marchés dans le commerce des fleurs coupées*. [Refrigeration a regulator of the cut flower trade.] Revue Hort. 92: 175-176. 1920.—An argument for the installation of refrigeration plants as community enterprises at the points of origin of the crops or at the market centers.—E. J. Kraus.

1190. SMALL, JOHN K. *Chamaecrista Deeringiana*. Addisonia 4: 1-2. Pl. 121 (colored). 1919.—A full description is given of this perennial species, a native of southern Florida, with notes on the related species *C. brachiata*. *C. Deeringiana* is readily distinguishable by its stout, elongated, horizontal rootstock which is stated to be quite an exception in this genus.—T. J. Fitzpatrick.

1191. SMALL, JOHN K. *Heliotropium Leavenworthii* Torr. Addisonia 4: 29-30. Pl. 135 (colored). 1919.—A lengthy description with comment is included of this species, which occurs on the edges of the Everglades and in the adjacent pinelands of southern Florida. T. J. Fitzpatrick.

1192. SMALL, JOHN K. *Heliotropium polyphyllum* Lehm. Addisonia 4: 25-26. Pl. 133 (colored). 1919.—A full description with comments is given. The species is a native of southern Florida and tropical America.—T. J. Fitzpatrick.

1193. SMALL, JOHN K. *Ipomoea tenuissima*. Addisonia 4: 15-16. Pl. 128 (colored). 1919.—A full description is given of this pink morning-glory, a native of the pine woods of southern Florida, Cuba, and Hispaniola.—T. J. Fitzpatrick.

1194. SMALL, JOHN K. *Limodorum Simpsonii*. Addisonia 4: 7-8. Pl. 124 (colored). 1919.—A full description is given of this terrestrial orchid, a native of the Everglades of Florida, found also in the Bahamas and Cuba.—T. J. Fitzpatrick.

1195. SMALL, JOHN K. *Mentzelia floridana*. Addisonia 4: 13-14. Pl. 127 (colored). 1919.—A species of the Loasa family, found about hammocks in Florida and the Bahamas.—T. J. Fitzpatrick.

1196. SMALL, JOHN K. *Okenia hypogaea*. Addisonia 4: 11-12. Pl. 126 (colored). 1919.—A species of the four-o'clock family, originally collected on sand hills near Vera Cruz, Mexico, since found in southern Florida. This species is the type of the genus.—T. J. Fitzpatrick.

1197. SMALL, JOHN K. *Rhabbadenia corallicola*. Addisonia 4: 33-34. Pl. 137 (colored). 1919.—An erect or diffuse shrub of the family Apocynaceae, native of southern Florida, occurring in the pinelands, and blooming throughout the year. A full description is given with notes and comment.—T. J. Fitzpatrick.



1198. TURBAT, E. *Deux belles roses*. [Two good roses.] *Revue Hort.* 92: 178. 1 pl (colored). 1920.—The variety Willowmere (Pernet-Ducher 1913) is the result of a cross between an unnamed variety and Lyon Rose, which latter it much resembles but is an improvement in being more hardy and floriferous; Arthur R. Goodwin (Pernet-Ducher 1909) is the offspring of a seedling crossed with Soleil d'Or, reddish orange copper in color and vigorous. Both are suited for breeding or for use as cut-flowers.—*E. J. Kraus*.

1199. VACHEROT, M. *Les Oeillets a grandes fleurs*. [Large flowered carnations.] *Revue Hort.* 92: 176-177. Fig. 60-61. 1920.—Notes relative to recent improvement in the quality of carnations, particularly of the American type, together with brief cultural directions.—*E. J. Kraus*.

### HORTICULTURE PRODUCTS

1200. ANONYMOUS. [Rev. of: KNAPP, A. W. *Cocoa and chocolate: their history from plantation to consumer*. xii + 210 p., illus. Chapman & Hall: London, 1920.] *Sci. Prog.* [London] 15: 320-321. 1920.

1201. ANONYMOUS. *The palm sugar industry in Bengal*. Louisiana Planter and Sugar Manufacturer 65: 3-4. 1920.—The palm sugar industry is very old but is declining at present. The Phoenix and Borassus palms are the ones chiefly used. Bengal produced 10,000 tons of palm sugar in 1913-14.—*C. W. Edgerton*.

1202. BURNS, W. *The drying of bananas*. *Agric. Jour. India* 15: 166-173. 1920.—The investigation shows that sun heat is sufficient for the drying of bananas and that all varieties can be successfully dried. For a good color a card board screen should be used during the last few days of drying. The product should be stored in air tight tins. The apparatus used is a simple lattice tray which can be closed with covers. Fully ripe fruit free from skin should be used.—*J. J. Skinner*.

1203. PARIS, G. *L'industria delle ciliege bianche*. [White cherry industry.] *Staz. Sperim. Agrarie Ital.* 53: 187-227. 1920.—This is a study of the commercial phases of the industry and of the scientific principles underlying it.—*A. Bonazzi*.

1204. PATWARDHAM, V. G. *Gur-making from the juice of the date-palm (Phoenix sylvestris) in the Thama District of the Bombay Presidency*. *Agric. Jour. India* 15: 525-532. 1920.—Experiments were made to determine the best juice suitable for gur making and to get gur of solid crystalline consistency. Juice treated with formalin gave solid gur of good grain; chloroform likewise gave solid gur, but with no grain. Juice treated with acetic acid produced gur which was soft and sticky, of good light color, but not of good taste. Tartaric acid added to juice gave a solid crystalline gur, with no change in color. The data are presented in tabular form, showing the effect of different processes and varying amounts of acid on the qualities of gur.—*J. J. Skinner*.

1205. PRAY, LUIS. *Practicas generales sobre la elaboracion de los vinos*. [Practical methods of making wines.] *El Agricultor* [Santiago, Chile] 5: 53-57. 1920.—Discusses collecting, milling, sulphitation, fermentation, and other steps in the process of making wine.—*John A. Stevenson*.

## MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 779, 788, 943, 1013, 1019, 1021, 1041, 1044, 1085, 1342, 1367, 1374, 1429, 1494)

1206. BELYEA, H. C. Ray tracheid structure in second growth *Sequoia Washingtoniana*. Bot. Gaz. 68: 467-476. 5 fig. 1919.—Second growth trunks of *Sequoia washingtoniana* are wanting in true ray tracheids; instead, vertical wood tracheids bend at the ray, and are contiguous thereto for some little distance. Communicating pits develop in these contiguous walls of rays and tracheids. These modified vertical tracheids are believed to function as ray tracheids.—H. C. Cowles.

1207. BOUYGUES, H. Le meristeme terminal de la tige et sa division en regions. [The terminal meristem of the stem and its division into zones.] Compt. Rend. Acad. Sci. Paris 171: 926-927. 1920.—Two regions of the meristem, a prevascular and a cortical zone, are distinguished.—C. H. Farr.

1208. BUGNON, P. Sur l'emploi d'encre commerciales en histologie végétale. [On the use of commercial inks in vegetable histology.] Compt. Rend. Acad. Sci. Paris 169: 1051-1054. 1919.—Commercial inks having a base of tannin and iron sulphate have been successfully employed in the staining of pectin-cellulose membranes, giving a blue which is adapted to the use of a counter stain of red, brown, or green. Inks having log-wood (haematoxylin) as a base have also been shown to be satisfactory for certain purposes. Formulas for the preparation of ink stains with various other stains are given.—V. H. Young.

1209. DETJEN, L. R. Peloria in *Viola primulaefolia* Linn. Torrey 20: 107-116. Fig. 1-11. 1920.—Peloria in European species of *Viola* (*V. odorata* and *V. hirta*) has been known since 1775. Two forms are recognized, the incomplete and the complete. A plant of *V. primulaefolia* was discovered at West Raleigh, North Carolina, producing flowers not only with all the various forms of peloria, but with a general reduction and tendency toward numerical uniformity in all the floral whorls. In this plant the flower was not only perfectly regular but all the parts were in fours. Other plants collected at the same station possessed from 1 to 4 saccate petals, and showed variations in the number and character of parts in each floral whorl. Plants grown from seed of these peloric plants produce peloric flowers, which remain uniform under great differences of environment, and such plants apparently breed true to type both vegetatively and sexually.—J. C. Nelson.

1210. GATIN, V. C. Recherches anatomiques sur le pedoncule et la fleur des Liliacées. [An anatomical study of the peduncle and flower of the Liliaceae.] Rev. Gén. Bot. 32: 460-528. Fig. 32-55. 1920.—A continuation of the anatomical study previously reported. In this number the 10th tribe of the Lilioideae is covered, together with the tribes of the sub-family Asphodeloideae and 5 tribes of the sub-family Asparagoideae.—J. C. Gilman.

1211. LAND, W. J. G. Botany of the living plant. [Rev. of: BOWER, F. O. Botany of the living plant. x + 580 p., 447 fig. Macmillan: London, 1919 (see Bot. Absts. 4, Entries 526, 1394; 7, Entry 1608).] Bot. Gaz. 68: 478-479. 1919.—The book is highly praised for its embodiment of long years of first-hand contact with material and of long teaching experience. The gymnosperms are felt to be inadequately treated, and minor criticisms are noted in the treatment of the liverworts.—H. C. Cowles.

1212. SCHAFFNER, JOHN H. A remarkable bud sport of *Pandanus* [utilis]. Jour. Heredity 10: 376-378. Fig. 14. 1919.—The bud sport (mutation) shows a two-ranked arrangement of the leaves without spiral twist as opposed to the normal three-ranked arrangement with spiral twist. A progressive phyletic arrangement is suggested for the related genera *Pandanus*, *Sparganium*, and *Typha*.—J. R. Schramm.



1213. SCHERTZ, F. M. Early development of floral organs and embryonic structures of *Scrophularia marylandica*. Bot. Gaz. 68: 441-450. 3 pl. 1919.—The order of development of floral parts is calyx, stamens, corolla, pistil, the stamens and corolla arising from a common outgrowth. The megaspore archesporium consists of 1 hypodermal cell, functioning as a megaspore mother cell, which gives rise to an axial row of 4 potential megaspores. The embryo sac comes from the chalazal one, the others degenerating. The mature sac has 1 egg, 2 large synergids, an endosperm nucleus, and 3 antipodal nuclei which soon degenerate. A secondary endosperm nucleus was observed, also the fusion of polar nuclei. The 1st division of the fertilized egg is transverse, and is followed by a longitudinal division of the chalazal nucleus. The nucellus consists of a single cell layer around the megaspore. A 1-celled tapetal layer develops around the sac, forming as the megaspore mother cell divides. Two prominent haustoria form at the chalazal end of the sac, and 4 weaker ones at the micropylar end. There is a single thick integument. Before the egg divides, endosperm cells form, separating the egg from the micropylar end. There is a short suspensor, which disappears at embryo maturity. In the seed the embryo is surrounded by thick endosperm cells gorged with food.—F. M. Schertz.

1214. SCHÜEPP, OTTO. Beiträge zur Entwicklungsgeschichte der Stockausschläge. [Concerning the developmental history of stem shoots.] Vierteljahrsschr. Naturforsch. Ges. Zurich 63: 106-115. 1918.—The vegetative point of a lateral shoot arises as a small meristem-complex and begins developing leaves long before it has attained the size and structure of the mother vegetative point.—John H. Schaffner.

1215. SCHÜEPP, OTTO. Zur Entwicklungsgeschichte des Blattes von *Acer pseudoplatanus* L. [Developmental history of the leaf of *Acer pseudoplatanus* L.] Vierteljahrsschr. Naturforsch. Ges. Zurich 63: 99-105. 1918.—An outline of the origin of the various leaf tissues from the meristem.—John H. Schaffner.

1216. SOUÈGES, RENÉ. Embryogenie des Urticacées. Développement de l'embryon chez l'*Urtica pilulifera* L. [The embryology of the Urticaceae. The development of the embryo of *Urtica pilulifera*.] Compt. Rend. Acad. Sci. Paris 171: 1009-1011. 1920.—A scheme is presented for tabulating the development of the embryo of angiosperms, showing the parts from which each portion of the embryo is derived and the separation of the various primordia in the successive divisions. The development of the embryo of *Urtica* is found to follow in general that of *Senecio vulgaris*.—C. H. Farr.

1217. THODAY, M. G. Anatomy of the ovule and seed of *Gnetum gnemon* with notes on *Gnetum funiculare*. Ann. Botany 35: 37-54. Pl. 1, fig. 1-5. 1921.—The changes which take place in the envelopes of the ovule of *G. gnemon* during development are described. The micropylar tube which is a continuation of the innermost of the 3 envelopes becomes closed. A flange-like outgrowth of this tube becomes fused at the top with the outermost envelope and at the bottom projects over the middle envelope. The growth of the outer covering carries the closed micropylar tube upwards causing its apical region to break away from the base. This upper region thus forms a sort of stopper which is carried still further upwards. The basal part then projects as a sort of beak through the opening at the top of the middle covering. The conditions here described are compared with those in Bennettitales.—W. P. Thompson.

1218. THOMPSON, W. P. Companion cells in bast of *Gnetum* and angiosperms. Bot. Gaz. 68: 451-459. 7 fig. 1919.—*Gnetum* has companion cells resembling those of angiosperms in size, structure, and location, but not in development; in *Gnetum* sieve tubes and companion cells are produced from different rows of cambial cells, instead of from 2 successive cells in a single row. This is thought to indicate parallel evolution rather than genetic relationship.—H. C. Cowles.

1219. WILLIAMSON, H. S. A new method of preparing sections of hard vegetable structures. Ann. Botany 35: 139. 1921.—Hard materials to be sectioned are transferred from water to

pure acetone and then to a 12 per cent solution of cellulose acetate in acetone. By this method they are not only imbedded but also softened. Woods such as oak or beech are sufficiently softened for sectioning after 6 days in the solution.—*W. P. Thompson.*

1220. WISSELINGH, C. VAN. Bijdragen tot de Kennis van de Zaadhuid. Achtste bijdrage: Over de Zaadhuid bij de orde der Centrospermae. [Contribution to a knowledge of the seed-coat. Eighth contribution: The seed-coat of the Centrospermae.] Pharm. Weekbl. 57: 1193-1211. Pl. 1, fig. 10. 1920.—In the campylotropic ovule of the Centrospermae 3 cuticles can be distinguished, 1 on the epidermis, 1 between the 2 integuments, and 1 between the innermost integument and the nucellus. During the development of the ovule into the seed in some cases (Caryophyllaceae) the cuticle on the epidermis disappears; in other cases (*Beta vulgaris*, *Amaranthus caudatus*, *Portulaca grandiflora*) the cuticle between the 2 integuments is lost, either partly or altogether. The cuticle between the seed-coat and the nucellus remains and becomes rather thick. In the chalaza a cork-tissue is developed, which borders the thick cuticle between the seed-coat and the nucellus but which differs from other chalaza cork tissues in that the cork-cells are thickened at the corners (*Beta vulgaris*) or in that the cell-walls are covered with a cutin-like substance.—*H. Engelhardt.*

## MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

(See also in this issue Entries 932, 933, 1291, 1360)

1221. BRISTOL, B. MURIEL. On a Malay form of *Chlorococcum humicola* (Näg.), Rabenh. Jour. Linn. Soc. Bot. London 44: 473-482. Pl. 17-18. 1920.—The author describes an alga obtained by culture from a sample of soil from Kuala Lumpur that had been dry for two years. Reproduction by zoospores, which may also act as gametes, was observed. Aplanospores are formed which germinate and produce a palmella-stage, and these cells produce the usual vegetative cells directly, or indirectly by means of zoospores. In dried soil samples *Chlorococcum* has been known to retain its vitality more than 70 years.—*E. N. Transeau.*

1222. BRISTOL, B. MURIEL. A review of the genus *Chlorochytrium*, Cohn. Jour. Linn. Soc. Bot. London 45: 1-28. Pl. 1-3, fig. 1. 1920.—In continuation of the work of G. S. West in submerging 6 genera into the genus *Chlorochytrium*, this paper contains a critical discussion of the present limits of the genus and the criteria that may be used to define species. As a result of further study of the morphology of these forms, 10 well-defined and 3 doubtful forms are included in the genus. The recognized species are: *Chlorochytrium Lemnae* Cohn; *C. bienne* (Klebs) G. S. West; *C. paradoxum* (Klebs) G. S. West; *C. Facciolaiae* (Borzi) Bristol, and var. *minor* (Borzi) Bristol; *C. grande* Bristol; *C. Limnanthemum* (D.D. Cunningham) G. S. West; *C. inclusum* Kjellman, and var. *dermatocolax* (Reinke) Bristol; *C. Sarcophyci* (Whitting) G. S. West; *C. Cohnii* E. P. Wright, and var. *Porphyrae* (Gardner) Bristol; and *C. Moorei* Gardner. The doubtful forms are *C. laetum* Schroeter, *C. viride* Schroeter, and *C. rubrum* (Schroeter) Freeman.—*E. N. Transeau.*

1223. BRITTON, NATHANIEL LORD, AND CHARLES FREDERICK MILLSPAUGH. The Bahama Flora. Roy. 8vo., viii + 695 p. Published by the authors: New York, June 26, 1920.—See Bot. Absts. 7, Entry 1429.

1224. CONRAD, W. Contributions a l'étude des Chrysomonadines. [Contributions to the study of the Chrysomonads.] Bull. Acad. Roy. Belgique, Cl. Sci. 1920<sup>4-5</sup>: 167-189. 11 fig. 1920.—The author takes up first *Synura Uvella* Ehr., and brings together his own observations and those of others on the cell, its division, and the formation of colonies. *Thallochrysis Pascheri* is described as a new genus and species, the type of a new family, the Thallochrysidaceae. The taxonomic characters of *Chrysopsis sphagnorum* n. sp. and other indigenous species of *Chrysopsis* are given.—*Henri Micheels.*



1225. COSTANTIN, J. Travaux recents sur les Thallophytes. [Recent work on the Thallophytes.] Ann. Sci. Nat. Bot. X, 1: xxx-xxxvi. 1919.—The author calls attention to studies on Laminarias, mentioning especially C. SAUVAGEAU's contributions to knowledge of their life cycle. Reproductive bodies borne along median line of blades are asexual (zoospores) and are said to give rise on germination to minute filamentous sexual thalli which are dioecious. In *Sacchorhiza* the female thallus is obliterated and the egg is the protoplasm of the zoospore made ready for fertilization. Actual observation of fusion of gametes is not reported. Sauvageau's cultural methods are briefly described. Economic possibilities of marine agriculture are dwelt upon.—James P. Kelly.

1226. FISCHER, L. Tabellen zur Bestimmung einer Auswahl von Thallophyten und Bryophyten. [Keys for the determination of a selected group of thallophytes and bryophytes.] 60 p. Bern, 1918.

1227. FORTI, ACHILLE. Elenco preliminare della flora pelagica del seno di Quarto dei Mille presso Genova. [Preliminary catalogue of the palagic flora of the Quarto dei Mille Bay, near Genoa.] La Nuova Notarisia 31: 65-72. 1920.—The paper consists of a list of 235 species of pelagic organisms, representing the groups Cystoflagellata (1), Dinoflagellata (Peridinales) (123), Acontae (Bacillariales) (101), Silicoflagellata (3), Cocco-sphaerales (1), and Chlorophyceae (6).—Marshall A. Howe.

1228. FRITSCH, F. E., AND E. STEVENS. Contributions to our knowledge of the freshwater algae of Africa: 3. Freshwater algae (exclusive of diatoms) mainly from the Transkei Territories, Cape Colony. Trans. Roy. Soc. South Africa 9: 1-72. Fig. 1-29. 1921.—An annotated list of algae collected in South Africa enumerating 146 species belonging to 63 genera, including Isokontae, Heterokontae, Cyanophyceae, Florideae, and Flagellata. Six new species, a new subspecies, and 13 new varieties are described. The new species are *Enteromorpha basiramosa*, *Closterium pegleri*, *C. pseudolibellula*, *Euastrum submontanum*, *E. simpliciforme*, and *Spirogyra subreticulata*.—E. N. Transeau.

1229. GARD, MEDERIC. Biologie d'une nouvelle espece d'Euglene (*Euglena limosa* nov. spec.). [Biology of a new species of *Euglena* (*Euglena limosa* nov. spec.).] Compt. Rend. Acad. Sci. Paris 169: 1423-1425. 1919.—A brief description of the morphological characteristics and behavior of a new species of *Euglena*, *E. limosa*, and a discussion of the work of ROSE BRACHER [Ann. Bot. 33: 93-108. 1919] on *Euglena deses*, Ehrenberg.—V. H. Young

1230. GHOSE, S. L. *Campylonema lahorensis*, a new member of Scytonemaceae. New Phytol. 19: 35-39. Fig. 1-6. 1920.—A blue-green alga from Lahore, formerly referred by the author to *Tolypothrix arenophila* W. and G. S. West, is here shown to be distinct and is described under the name given.—I. F. Lewis.

1231. GHOSE, S. L. The Myxophyceae of Lahore. Jour. Indian Bot. 1: 8-13. 1919.—An annotated list of blue-green algae of Lahore, India.—E. N. Transeau.

1232. GROVE, W. B., B. MURIEL BRISTOL, AND NELLIE CARTER. The flagellates and algae of the district around Birmingham. Jour. Botany 58: Suppl. 3. 1-55. 1920.—The extensive list making up the bulk of this paper was compiled almost exclusively from records made by the late G. S. WEST during the last 13 years of his life. The summary of species listed is as follows: Flagellates, 33; Myxophyceae, 83; Peridineae, 6; Bacillarieae, 155; Chlorophyceae, 444; and Rhodophyceae, 6. A bibliography is appended.—K. M. Wiegand.

1233. HODGETTS, WILLIAM J. A new species of *Spirogyra*. Ann. Botany 34: 519-524. Pl. 22, 5 fig. 1920.—A description of *Spirogyra colligata* is presented. The species is remarkable in presenting a new form of cross walls between adjacent cells in the filaments. The cross walls are plane but possess an extra layer which recalls the so-called H-shaped pieces in the walls of *Microspora*. Conjugation may take place through the end walls as well as by the usual methods known for other species of the genus.—E. N. Transeau.

1234. HOWE, MARSHALL A. *Algae*, in Britton's "Flora of Bermuda," p. 489-540. 1918.—See Bot. Absts. 8, Entry 687.

1235. HOYT, W. D. *Marine algae of Beaufort, N. C., and adjacent regions*. Bull. U. S. Bur. Fisheries 36: 367-556. Pl. 84-119, 47 fig. 1920.—Following a general account of the region, the local distribution, the ecological factors, the seasonal distribution, and method of collecting and preserving algae are discussed. Most of the bulletin is given over to a systematic account of the 133 species and varieties found. Of these, 10 are Myxophyceae, 25 Chlorophyceae, 27 Phaeophyceae, and 71 Rhodophyceae. Descriptions, critical notes, and keys are given for all the species included. The plates are largely photographs. New species described are *Nitophyllum medium* and *Streblonema invisibile*.—E. N. Transeau.

1236. LEMOINE, MME. PAUL [LEMOINE, MARIE]. *Botanische Ergebnisse der Schwedischen Expedition nach Patagonien und dem Feuerlande 1907-1909*. VII. Les Melobesiées. [Botanical results of the Swedish expedition to Patagonia and Tierra del Fuego 1907-1909. VII. The Melobesiaceae.] K. Svenska Vetenskapsakad. Handl. 61<sup>4</sup>: 1-17. Pl. 1. 1920.—The author discusses and describes specimens collected by Dr. CARL SKOTTSBERG. Five species are attributed to the island of Chiloe, 1 to the island of Huafo, 2 to Juan Fernandez, 6 to Tierra del Fuego, 1 to the island of Atalaya, and 6 to the Falkland Islands. Six species, *Lithothamnium paucisporum*, *L. Caroli*, *L. (?) Skottsbergii*, *Lithophyllum (?) almanense*, *L. fernandezianum*, and *L. atalayense*, are described as new.—Marshall A. Howe.

1237. LEWIS, IVEY F., AND CONWAY ZIRKLE. *Cytology and systematic position of Porphyridium cruentum Naegeli*. Amer. Jour. Bot. 7: 333-340. 2 pl. 1920.—The authors give an account of the somewhat tangled taxonomic history of this species, and discuss briefly the conflicting descriptions of it which have been presented by various writers. From the results of their own observations, the authors suggest that previous workers may have studied different growth states of the same species rather than different species. The cells are surrounded by jelly and are usually borne on gelatinous stalks. The chromatophore is star-shaped in resting cells, amoeboid in growing ones. The pyrenoid is distinct, easily stainable and centrally located, and is generally spheroidal. In the resting stage there is a single eccentric globule of chromatin homologous to a nucleus or nucleolus. Nuclear division is crudely mitotic. The authors suggest that for the present *Porphyridium* should be kept in the Bangiaceae.—E. W. Sinnott.

1238. LINDEMANN, E. *Untersuchungen über Süsswasserperidineen und ihre Variationsformen II*. [Investigations of fresh-water Peridineae and their variations.] Arch. Naturgesch. Abt. A 84: 121-194. Fig. 1-200. 1918 [1920].—A continuation of work reported under the same title (Arch. Protistenk. 39: 209-262. Pl. 17, fig. 1-144. 1919). The author discusses the grouping of the Peridineae and describes his method of distinguishing and designating forms, subvarieties, subspecies, and varieties. Descriptions are given of 17 forms, 3 subvarieties, 31 varieties, and 14 species. He also discusses the distribution of members of the group with reference to season and composition of the water, and their association with other plankton constituents. Additional notes are given of stations for 27 species, 3 varieties, and 3 forms.—C. E. Allen.

1239. LUCAS, A. H. S. *Algae of Commonwealth Bay*. Australasian Antarctic Expedition, 1911-14, Sci. Rept. Ser. C. 7<sup>2</sup>: 18 p., 9 pl. 1919.—An account of the algae of the antarctic region with description of two new species: *Chaetomorpha Mawsoni* and *Iridaea Mawsoni*. Victoria Land and Commonwealth Bay are each credited with 14 species of which 8 are common.—E. N. Transeau.

1240. LYLE, LILIAN. *The marine algae of Guernsey*. Jour. Botany 58: Suppl. 2. 1-53. 1920.—The present list and notes, both ecological and taxonomic, were based on collections and field studies made in 1911, 1912, and 1914. In all, 250 species and 78 varieties and forms are listed from the island. *Chantransia Lorrain-Smithiae* Lyle and *Gelidium latifolium* Born.



var. *Hystrix*, forma *condensata* Holmes are described as new. Descriptions of some less well known species are given. In the section on ecology the author discusses the algal ecology of Guernsey under 7 headings: (1) Physical position of the island; (2) tides; (3) currents; (4) nature of the substratum; (5) configuration of the coast; (6) salinity; and (7) temperature. Three main regions are recognized: Upper littoral, middle littoral and sub-littoral. These are subdivided into zones to the extent of 15 in all. The zones are mostly named from their most characteristic plant. A comparison of the Guernsey algal flora with that of the neighboring coast is made. An account of the uses made of algae concludes the paper.—K. M. Wiegand.

1241. MARKLE, M. S. Some abnormalities in plant structure. Proc. Indiana Acad. Sci. 1918: 117-124. Fig. 1-9. 1920.—See Bot. Absts. 7, Entry 1066.

1242. PAULSON, R., AND S. HASTINGS. The relation between the alga and fungus of a lichen. Jour. Linn. Soc. London Bot. 44: 497-506. Pl. 21-22. 1920.—See Bot. Absts. 7, Entry 1994.

1243. PEASE, VINNIE A. Taxonomy and morphology of the ligulate species of the genus *Desmarestia*. Publ. Puget Sound Biol. Sta. 2: 313-367. Pl. 54-63. 1920.—One new species is erected, *Desmarestia herbacea*; and another announced, *D. latissima* Setchell & Gardner. There is a detailed discussion of the limits of these, and their relation to *D. tabacoides* Okamura; also a detailed discussion of the limits and history of *D. ligulata* (Lightfoot) Lamouroux and *D. herbacea* (Turner) Lamouroux. Details of the morphology of these 4 species clear up some fine points in their development and structure. Not finding reproduction the writer seems to doubt whether Okamura found it in *D. tabacoides*, and states that it may have been reproduction in a species of *Phycocelis* growing upon the *Desmarestia*.—T. C. Frye.

1244. PILGER, R. Algae Mildbraedianae Annabonenses. Bot. Jahrb. 57: 1-14. Fig. 1-34. 1920.—This is a list of the algae collected by Dr. J. MILDBRAED in 1911 on Annobon, the smallest of the Guinea Islands. Notes are given on distribution and critical features of morphology. Thirty-three species and varieties are included in the list of which the following are described as new: *Bryopsis densa*, *Struvea multipartita*, *Scinaia furcellata* (Turner) Biv. var. *constricta*, *Caulacanthus ustulatus* (Mert.) Kütz. var. *fastigiatus* (Kütz) Pilger n. comb. (*C. fastigiatus* Kütz), *Laurencia brachyclados*, *Herposiphonia brachyclados*, *Lophosiphonia adhaerens*. *Callithamnion Mildbraedii*, *Ceramium leptosiphon*.—K. M. Wiegand.

1245. PUYMALY, A. DE. Sur une petite algue verte aerophile (*Prasiola leprosa* Kütz.). [A small aerophilous alga (*Prasiola leprosa* Kütz.).] Compt. Rend. Acad. Sci. Paris 171: 189-192. 1920.—On the basis of the structure of the chromatophore and the normal reproduction by aplanospores it seems desirable to transfer the form referred to by PETERSEN as *Pleurococcus calcarius* to the species named in the title.—C. H. & W. K. Farr.

1246. RAINERI, R. Corallinacee del litorale tripolitano. [Corallinaceae of the Tripolitan littoral.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. V, 29<sup>a</sup>: 282-288, 313-318. 1920.—The following algae collected by C. F. PARONA in 1912-13 were studied and described after the methods of Mme. LEMOINE: *Lithothamnium crispatum* Haucki, *L. Haucki* Rothpeltz, *L. Lemormandi* Areschoug, *L. Philippii* Foslie, *L. fruticulosum* (Kütz.) Foslie, *Lithophyllum expansum* Philippi, *L. Byssoides* Lamark, *L. decussatum* Ellis and Solander, and *Melobesia Lejolisii* Rosan.—F. M. Blodgett.

1247. RAINERI, R. Corallinacee del litorale tripolitano. Nota III. [The Corallinaceae of the Tripolitan littoral.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. V, 29<sup>a</sup>: 356-358. 1920.—Continuing from previous articles he describes the following species of calcareous algae collected by Prof. PARONA: *Corallina officinalis* Linn., *C. mediterranea* Areschoug, and *Peyssonelia rubra* Grey. The first 2 are new to the Tripolitan littoral.—F. M. Blodgett.

1248. SAUVAGEAU, C. Nouvelles observations sur l'Ectocarpus Padinae Sauv. [New observations on Ectocarpus Padinae Sauv.] Compt. Rend. Acad. Sci. Paris 171: 1040-1044. 1920.—A study of the reproductive structures of this parasite of *Padina Pavonia* reveals three sorts of plurilocular structures, namely, the megasporangia, the meiosporangia, and the antheridia. The meiosporangia and the megasporangia both produce spores which develop into plants directly. The spores of the megasporangia vary from planospores to aplano-spores. These germinate without fecundation and hence the sperms are useless structures with no function in the life-history of the plants so far as is known. There are some indications that *Acinetospora pusilla* and *Ectocarpus Padinae* are different phases of the same life cycle, just as has been found in the Cutleriaceae and other families of the brown algae.—C. H. Farr.

1249. SCHRÖDER, B. Die neun wesentlichen Formentypen von Ceratium hirundinella O. F. Müller. [The nine fundamental form-types of Ceratium hirundinella.] Arch. Naturgesch. Abt. A. 84: 222-230. Fig. 1-9. 1918 [1920].—The author distinguishes, describes, and figures 9 forms falling within the limits of this species and discusses briefly types intermediate between these forms.—C. E. Allen.

1250. SCHRÖDER, BRUNO. Über Seebälle. [Concerning Pondballs.] Naturwissenschaften 8: 799-803. 1920.—The curious spherical growths of the algae *Aegagrophila*, *Spongomorpha*, *Valonia*, *Lithothamnium*, and *Rivularia*, as well as similar balls of animal origin are discussed in the above article.—O. L. Clark.

1251. SETCHELL, WILLIAM ALBERT, AND NATHANIEL LYON GARDNER. The marine algae of the Pacific coast of North America, Part 1, Myxophyceae. Univ. California Publ. Bot. 8: 1-138. Pl. 1-8. 1919.—The first part of the Marine Algae of the Pacific Coast of North America, comprising an account of the Myxophyceae, or blue-green algae, is presented by the authors without introduction or explanation, pending the publication of the other 3 parts. This part, otherwise, is complete in itself except as to an index. It has descriptions of the subclass, orders, families, genera, species, etc., together with citations of the literature, keys, distributional and critical notes. It contains no new species or new names.—W. A. Setchell.

1252. SETCHELL, WILLIAM ALBERT, AND NATHANIEL LYON GARDNER. The marine algae of the Pacific coast of North America, Part II, Chlorophyceae. Univ. California Publ. Bot. 8: 139-374. Pl. 9-33. 1920.—This is the 2nd part of the account of the Marine Algae of the Pacific Coast of North America, issued by the authors under the same conditions and in the same form as the first [see next preceding entry]. It contains no new species or new names.—W. A. Setchell.

1253. SETCHELL, WILLIAM ALBERT, AND NATHANIEL LYON GARDNER. Phycological contributions, I. Univ. California Publ. Bot. 7: 279-324. Pl. 21-31. 1920.—The following new genus, new species, and new combinations are proposed:—*Hormiscia doliifera* sp. nov., *Spongomorpha Mertensii* (Rupr.) comb. nov., *Capsosiphon fulvescens* (Ag.) comb. nov., *Enteromorpha groenlandica* (J. Ag.) comb. nov., *Monostroma areolatum* sp. nov., *Ulva stenophylla* sp. nov., *U. vezata* sp. nov., *U. angusta* sp. nov., *U. lobata* (Kuetz.) comb. nov., *U. expansa* (Setch.) comb. nov., *U. dactylifera* sp. nov., *U. taeniata* (Setch.) comb. nov., *Prasiola nevadensis* sp. nov., *P. meridionalis* sp. nov., *P. delicata* sp. nov., *Entocladia cingens* sp. nov., *E. codicola* sp. nov., *Internoretia* gen. nov., *I. Fryeana* sp. nov., *Pseudulvella prostrata* (Gardner) comb. nov., *Ps. applanata* sp. nov., *Ps. consociata* sp. nov., *Pseudopringsheimia apiculata* sp. nov., *Gomontia Bornetii* nom. nov., *G. habrorhiza* sp. nov., and *G. caudata* sp. nov.—W. A. Setchell.

1254. SMITH, GILBERT MORGAN. Phytoplankton of the inland lakes of Wisconsin. I. Myxophyceae, Phaeophyceae, Heterokontae, and Chlorophyceae exclusive of the Desmidiaceae. Bull. Wisconsin Geol. Nat. Hist. Survey 57. 243 p., 51 pl. 1920.—A detailed description of



the phytoplankton of Wisconsin lakes is presented. The species have been critically studied, and many new observations on life histories and variations are discussed. Keys to all the species are included. The following new species and varieties are described: *Crucigenia truncata*, *Selenastrum Westii*, *Echinosphaerella limnetica*, *Tetraedron victorieae* var. *major*, *Westella linearis*, *Volvox mononae*, *Chlamydomonas epiphytica*, *C. dinobryoni*, *Rhizochrysis limnetica*, *Gloeotheca linearis* var. *composita*, *Aphanocapsa elachista* var. *planctonica*, *Aphanocapsa endophytica*, *Merismopedia elegans* var. *major*, and *Chroococcus dispersus* var. *minor*.—*E. N. Transeau*.

1255. TILDEN, JOSEPHINE E. Bibliography of the literature relating to the Pacific Ocean algae and to the freshwater algae of the countries bordering upon the Pacific Ocean. 58 p. Privately published. 1920.—See Bot. Absts. 7, Entry 1606.

1256. VIIG, OLAF B. Brunalger og rodalger fra omegnen af Aalesund. [Brown and red algae from the vicinity of Aalesund, Norway.] *Nyt Mag. Naturvidenskaberne* 56: 167–176. 1919.—Notes are presented on distribution of algae found during summers of 1907 and 1909, chiefly on coast exposed to open sea.—*A. Gundersen*.

1257. WILLE, N. Algologische Notizen XXV–XXIX. [Algological notes.] *Nyt Mag. Naturvidenskaberne* 56: 1–60. 2 pl. 1919.—This series of notes deals with the following: The variability of *Scenedesmus bijugatus* and *S. obliquus*; the germination of aplanospores in *Coelastrum*; a list of the freshwater algae of Beeren Island; a change of the name *Lyngbya epiphytica* Wille to *L. Willei* Setchell & Gardner; and further study of Agardh's herbarium has led to additional synonyms for *Gloeocapsa sanguinea* Kütz., *Glaucozystis bullosa* (Kütz.) Wille, *Aphanocapsa mucicola* (Menegh.) Wille, *Gloeocapsa magma* Kütz., *Chroococcus aurantius* Wille, and *Tetraspora bullosa* Kütz.—*E. N. Transeau*.

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 953, 976, 1066, 1211, 1224, 1291)

1258. BRITTON, ELIZABETH G. Bahama mosses. *Bryologist* 24: 17–19. Pl. 1. 1921.—A list of the mosses contributed to the Bahama flora, 33 species in 28 genera, is here printed for convenience of reference. *Hymenostomum flavescens* E. G. Britton is described and figured.—*E. B. Chamberlain*.

1259. BROTHÉRUS, V. F. Contribution à la flore bryologique de l'Ecuador. [Contribution to the moss flora of Ecuador.] *Rev. Bryologique* 47: 35–46. 1920.—The first part of this paper has already been abstracted (see Bot. Absts. 7, Entry 350). In this second and concluding part 63 species of mosses belonging to 11 families are listed with the usual full data regarding stations. The families most largely represented are the Hookeriaceae with 17 species, the Hypnaceae with 13, and the Sematophyllaceae with 11. The following species, 15 in all, are described as new: *Crossomitrium saprophilum*, *C. splendens*, *Cyclodictyon Allionii*, *Hookeriopsis armata*, *Lepidopilum Allionii*, *L. argutidens*, *L. leucomioides*, *L. phyllophilum*, *L. subgracile*, *Pilotrichum armatum*, *P. longicaule*, *Pterogonium liliputanum*, *Rhynchostegium parvulum*, *Stereohypnum oxyrrhynchioides*, and *S. rivulare*.—*A. W. Evans*.

1260. GARJEANNE, A. J. M. Gemmen bei *Gymnocolea inflata* Dum. [Gemmae of *Gymnocolea inflata*.] *Hedwigia* 61: 300–302. 1 fig. 1919.—The author reports the occurrence of gemmae in *Gymnocolea inflata*, a species which was supposed to lack them. The gemmae are angular, very pale yellowish green bodies, 20–40 $\mu$  in diameter, and composed of 2 unequal cells. They germinate readily and grow in the usual way. The gemmae are borne on the margins of rudimentary pale green leaves and appeared in a dried up culture which had been moistened and thus stimulated to renewed growth. It is questioned whether any of the *Jungermanniae* are really without gemmae.—*D. Reddick*.

1261. HERZOG, TH. Die Laubmoose der II. Freiburger Mulukkenexpedition. [The mosses of the second Freiburg expedition to the Molucca (Spice) Islands.] *Hedwigia* 61: 286-299. Pl. 3, 7 fig. 1919.—The collections here reported upon were made by K. DENIGER, director of the expedition, and E. STRESEMANN, who accompanied him as zoologist. Most of the specimens came from the islands of Ceram and Buru and from the Malayan peninsula. The total number of species listed is 66, of which the following are described as new: *Dicranoloma braunfelsioides* from Ceram; *Ctenidium moluccense* and *Hypnodendron caducifolium* from Buru; *Ectropothecium serratum*, *Homaliodendron pinnatelloides*, *H. intermedium*, and *Taxithelium Denigeri* from the Malayan peninsula. Fifteen of the other species, which bear Herzog's name as authority, had already been published in a paper dated 1916. In addition several new varieties, forms, and combinations are proposed. The species illustrated are *Hymenodontopsis Stresemanii* Herzog, the 2 new species of *Homaliodendron*, and *H. flabellatum* (Dicks.) Fleischer.—D. Reddick.

1262. HOLZINGER, JOHN M. On our American form of *Timmia megapolitana* Hedw. *Bryologist* 23: 86-88. Fig. 1-5. 1920.—The American specimens referred to *Timmia megapolitana* are shown to differ from the European in several respects. The leaves, for example, are less papillose and less serrate, the leaf-base is more hyaline, the antheridia are yellow, and the calyptra remains attached. The actual status of the American plant is at present undecided.—E. B. Chamberlain.

1263. HOLZINGER, JOHN M. Dixon and Watts on Antarctic mosses. [Rev. of: DIXON, H. N., AND W. W. WATTS. Mosses. Australasian Antarctic Expedition Sci. Rept. Ser. C. 7: 1-9. 1918 (see Bot. Absts. 7, Entry 1973).] *Bryologist* 23: 47. 1920.—The reviewer commends the conservative tendency of the authors in their treatment of the genus *Bryum*.—E. B. Chamberlain.

1264. LORCH, WILHELM. Über das Vorkommen von Calciumoxalatkrystallen in den Sporogonien von *Polytrichum commune* L. [On the occurrence of crystals of calcium oxalate in the sporogonia of *Polytrichum commune*.] *Hedwigia* 60: 342-349. 1919.—The presence of crystals of calcium oxalate in the capsules of *Polytrichum commune* is reported. Other species of *Polytrichum* examined failed to show them, and they have not been demonstrated in any other bryophytes. The crystals are most abundant in the epidermal cells of the spore-case but occur also in the columella, the walls of the spore-sac and the operculum. In discussing the structure of the capsule certain dorsiventral peculiarities are emphasized.—A. W. Evans.

1265. LUISIER, A. Les mousses de Madère. [Mosses of Madeira.] *Broteria Ser. Bot.* 18: 99-120. 1920.—The present article (the ninth of the series) contains analytic keys to all the families, genera, and species of mosses (through *Fissidens*), which occur in Madeira and the adjoining islands. The keys incorporate brief descriptions and have references to the author's previously published articles. [See Bot. Absts. 1, Entry 757; 3, Entries 2447, 2448; 6, Entry 156; 7, Entry 351].—E. B. Chamberlain.

1266. MACHADO, ANTÓNIO. Catálogo descritivo de Briologia Portuguesa. [Descriptive catalogue of Portuguese mosses.] 143 p. Lisbon, 1919.—This catalogue lists all the species and varieties of mosses occurring in Portugal. Of most species the author has seen authentic material; in the remaining cases he cites authoritative records. To facilitate determinations analytic keys based upon easily determined vegetative characters are included, and each species or variety is characterized in 4 or 5 lines of description in the body of the work. In all cases where fuller descriptions are not accessible in standard works, a foot-note gives the original description in full. The total census, omitting varieties, shows 7 species of Sphagnales, 4 of Andreaeales, and 313 of Bryales. The classification follows that of Dixon & Jameson's Handbook. For each form there is a detailed statement of distribution for Portugal, definite localities and collectors being cited without generalized statements. Following the catalogue there is a glossary, a page of errata, a page of addenda, and a complete



index. The author has not hesitated to revive old names or to reduce species to varieties. There are in consequence over 20 new combinations, although no forms whatsoever are proposed as new. The new specific combinations proposed are the following, Machado being the authority in each case: *Camptothecium philippeanum* (Spruce), *Cinclidotus mucronatus* (Brid.), *Plagiopus ithyphyllus* (Brid.), *P. pomiformis* (Hedw.), *P. strictus* (Brid.), *Tortula meridionalis* (Luisier), and *Trichostomum humile* (Hedw.).—E. B. Chamberlain.

1267. MÖLLER, H. Beiträge zur Moosflora Javas, Straits Settlements und Birmas. [Contributions to the moss flora of Java, the Straits Settlements and Burma.] Hedwigia 60: 313-330. 5 fig. 1919.—The author enumerates 206 species of mosses which he collected in 1897, giving definite localities in each case. Of the species listed 194 came from Java, 28 from the Straits Settlements, and 14 from Burma, most of the species from the last 2 regions being recorded also from Java. Three of the Javan species are likewise listed from Sumatra. The specimens were all determined by V. F. BROTHÉRUS and the following 3 species, all from Java, are proposed as new on his authority and figured: *Acanthocladium scabrifolium*, *Rhizogonium salakanum*, and *Stereophyllum Mölleri*.—A. W. Evans.

1268. PEARSON, WM. HY. *Aplozia Pendletonii* Pearson. Bryologist 23: 84-85. Fig. 1-3. 1920.—This note completes the description of a species of hepatic recently proposed as new [see Bot. Absts. 7, Entry 352].—E. B. Chamberlain.

1269. PEARSON, WM. HY. *Porella rivularis* (Nees) Lindb. Bryologist 23: 85-86. 1920.—This note, which is based on material from Oregon collected by C. POTTER, deals with the synonymy and distinctive characters of the hepatic, *Porella rivularis*.—E. B. Chamberlain.

1270. POTIER DE LA VARDE, R. Observations sur quelques espèces du genre *Fissidens*. [Observations on certain species of the genus *Fissidens*.] Rev. Bryologique 47: 33-35. 1920.—The earlier parts of the series to which the present paper belongs have already been abstracted (see Bot. Absts. 5, Entry 627; 6, Entry 158; 7, Entry 1975). In this part *Fissidens Monquilloni* Thériot and its occurrence in the French departments of la Mayenne and la Manche are discussed. The distinctive features of the species are described, several specimens from the departments in question are referred to it, and the opinion is advanced that it has a wider distribution than had been supposed.—A. W. Evans.

1271. POTIER DE LA VARDE, R. Sur le pédicelle du *Stereophyllum Bremondii* Th. et P. de la V. [On the seta of *Stereophyllum Bremondii*.] Rev. Bryologique 47: 35. 1920.—The seta of *Stereophyllum Bremondii* is smooth, while that of the closely related *S. Blatteri* is papillose. Through an oversight this distinction was not brought out in the original description of *S. Bremondii*. (See Bot. Absts. 7, Entry 1976).—A. W. Evans.

## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, Editor

(See also in this issue Entries 953, 1074, 1111, 1211, 1344, 1347, 1348, 1349, 1350, 1352, 1353, 1354, 1355, 1356, 1382, 1386, 1390, 1392, 1395, 1398, 1402, 1405, 1409, 1410, 1541)

### FUNGI

1272. ADAMS, J. F. Observations on the infection of *Crataegus* by *Gymnosporangium*. Mycologia 13: 45-49. Fig. 1-4. 1921.—Ten species of *Crataegus* not previously reported as hosts for *Gymnosporangium germinale* and 6 not previously reported for *G. globosum* are included.—H. R. Rosen.

1273. ARTHUR, J. C. Nineteen years of culture work. *Mycologia* 13: 12-23. 1921.—A discussion of the writer's conception as to what criteria must be used in delimiting rust species, and an exposition of various changes in this conception as brought about by the gradually increasing knowledge of the rusts. Cultural work (infection experiments) was primarily undertaken to aid in a proper taxonomic treatment of species and the results of 19 years of such effort are shown to have aided (1) in completing the life cycles for many species, (2) in recognizing races within a species, and (3) in assuring a liberal point of view concerning the fixity of such features as open or covered telia, 1- or 2-celled teliospores (*Uromyces* and *Puccinia*), variation in number of the pores of the urediniospore, and in the position of these pores. By means of cultural work much progress was made in delimiting a number of distinct species among the grass rusts possessing sub-epidermal telia and in reducing to synonymy a large number of names. American *Carex* rusts, all of which had borne the names *Puccinia caricis* or *P. caricina*, were separated into a number of distinct species. The idea, held when the cultural work began, that hosts of any one species of rust would be found to be closely related was upset when it was shown that the aecial hosts of *Puccinia subnitens* belonged to a number of different families. The conception of species was further modified when it was found that collections of a single rust on different hosts show marked morphological differences. Cultures also showed that teliospores among the grass rusts are not necessarily resting spores. "The culture work began with the too prevalent idea that all rusts could be expected to conform in general to the well known *Puccinia graminis*. It closed with the conviction that the rusts are far too diversified in their morphology, their numerous characters, their physiological adaptations, and their range of hosts, to be represented by *Puccinia graminis* in more than one out of numerous aspects."—H. R. Rosen.

1274. ARTHUR, J. C. New species of Uredineae XII. *Bull. Torrey Bot. Club* 47: 465-480. 1920.—*Melampsora americana*, *Puccinia offuscata*, *P. senilis*, *P. gulosa* H. S. Jackson, *Uredo contraria*, *U. nitidula*, *Aecidium Izorae*, *Ae. indecisum*, *Ae. Mitellae* Ellis & Ev., *Ae. sub-simulans* Arthur & Mains, *Ae. Betheli*, *Ae. arcuatum*, *Ae. renatum*, *Ae. arcularium*, *Ae. Liabi*, *Ae. Batesii*, *Ae. Mesadeniae*, and *Ae. praecipuum* are described as new species. The following new names and new combinations are also given: *Pucciniastrum americanum* (Farl.) comb. nov., *Puccinia proximella* (Arth.) comb. nov., *P. hiascens* nom. nov., *P. Heterisiae* H. S. Jackson nom. nov., *Uromyces imperfectus* nom. nov., and *Uredo laticolor* nom. nov.—P. A. Munz.

1275. BAL, S. N. *Commentationes Mycologicae*. 8. *Pseudoperonospora cubensis* (B. & C.) Roxten, on *Trichosanthes dioica* Roxb. *Jour. Dept. Sci. Calcutta Univ.* 3: 1-3. 4 fig. 1920.—The first record of the fungus from Bengal. A short description is given.—Winfield Dudgeon.

1276. BAL, S. N. *Commentationes Mycologicae*. 9. *Cercospora personata* (B. & C.) Ellis, on *Arachis hypogaea* Linn. *Jour. Dept. Sci. Calcutta Univ.* 3: 4-6. 4 fig. 1920.—A record of the occurrence of the fungus in Bengal.—Winfield Dudgeon.

1277. BAL, S. N., AND K. G. BANERJEE. *Commentationes Mycologicae*. 10. *Rhynocladium corticolum* Mass., on the bark of *Mangifera indica* Linn. *Jour. Dept. Sci. Calcutta Univ.* 3: 7-8. 5 fig. 1920.—A record of the occurrence of the fungus in Bengal.—Winfield Dudgeon.

1278. BARLOT, J. Sur de nouvelles réactions colorées utilisables pour la diagnose d'espèces mycologiques. [On new color reactions useful in distinguishing species of fungi.] *Compt. Rend. Acad. Sci. Paris* 171: 1014-1016. 1920.—An aqueous solution of potash in 20-40 per cent concentration is recommended. It can be used to distinguish the poisonous *Mycena pura* from the edible *Laccaria laccata*, the former giving a yellow and the latter a dark brown color. *Gomphidius viscidus* gives a violet brown, *G. glutinosus* a feeble yellowish brown, and *Amanita junquilla* an orange yellow color; and *Lactarius turpis* yields a variety of color reactions with various acids and alkalis.—C. H. Farr.



1279. BLASDALE, WALTER C. A preliminary list of the Uredinales of California. Univ. California Publ. Bot. 7: 101-157. 1919.—A list of the rusts of California intended to assist collectors in naming new collections and to tabulate all the known forms and their host plants. Some 236 species or forms are enumerated, arranged under the genera according to the families of the host-plants they inhabit.—W. A. Setchell.

1280. BONAR, LEE. Wilt of white clover, due to *Brachyспорium trifolii*. Phytopath. 10: 435-441. 3 fig. 1920.—A disease of the foliage of white clover, *Trifolium repens*, found on a lawn near Washington, D. C., is described. Some cultural characters and a technical description of *Brachyспорium trifolii* Kauffman are given.—F. R. Jones.

1281. BRITTON, NATHANIEL LORD, AND CHARLES FREDERICK MILLSPAUGH. The Bahama Flora. Roy. 8vo., viii + 696 p. Published by the authors: New York, June 26, 1920.—See Bot. Absts. 7, Entry 1429.

1282. BROWN, NELLIE A. A *Pestalozzia* producing a tumor on the sapodilla tree. Phytopath. 10: 383-394. 5 fig. 1920.—This disease occurred in Buena Vista, Florida. The results of inoculation both upon sapodilla and upon other hosts are reported. The spores are described. Favorable media are mentioned. Comparison with other tumor-forming species of *Pestalozzia* indicates that this is a separate species. The name *Pestalozzia scirrofaciens* n. sp. is suggested. Control consists of destruction of infected trees.—Ruth G. Bitterman.

1283. CHURCH, MARGARET B. Laboratory experiments on the manufacture of Chinese Ang Khak in the United States. Jour. Indust. Eng. Chem. 12: 45-46. 1920.—The characteristics of red rice are due to a mold, *Monascus purpureus*.—Henry Schmitz.

1284. CLELAND, J. BURTON, AND EDWIN CHEEL. Australian Fungi: Notes and descriptions. No. 2.—The Sclerotia-forming polypores of Australia. Trans. and Proc. Roy. Soc. South Australia 43: 11-22. Pl. 1-5. 1919.—There is brought together within the limits of the article all that is known of the sclerotial forms of polypores of Australia. Two are described as possessing true sclerotia: *Polyporus mylittae* Cooke and Massee and *Polyporus minor-mylittae*. Two are described as possessing false sclerotia: *Polyporus tumulosus* Cooke and *Polyporus basilapiloides* (McAlp. and Tepper). The article is accompanied by photographs of sclerotia and of sclerotia to which fruiting bodies are attached. [See also Bot. Absts. 4, Entry 1070; 8, Entry 1285.]—J. H. Faull.

1285. CLELAND, J. BURTON, AND EDWIN CHEEL. Australian fungi: Notes and descriptions. No. 3. Trans. and Proc. Roy. Soc. South Australia 43: 262-315. Pl. 28-29. 1919.—This paper is a continuation of two previous ones on Australian fungi. The following species are described as new: *Amanitopsis punctata*, *Clitocybe paradiatopa*, *Cantharellus lilacinus*, *C. imperatae*, *C. nigripedes*, *C. corrugatus*, *Russula Flocktonae*, *R. erumpens*, *Mycena banksiae*, *M. coccineus*, *Pleurotus subostreatus*, and *Boletus scarlatinus*. [See also Bot. Absts. 4, Entry 1070; 8, Entry 1284.]—J. H. Faull.

1286. COUTINHO, ANTONIO XAVIER PEREIRA. Eubasidiomycetes Lusitanici Herbarii Universitatis Olisiponensis. [Eubasidiomycetes of Portugal represented in the herbarium of the University of Lisbon.] 195 p. Manuel Lucas Torres: Lisbon, 1919.—A taxonomic paper giving descriptions of all the Eubasidiomycetes of Portugal as represented in the herbarium of the University of Lisbon. The paper is not illustrated. It is provided with keys to the genera. A total of 511 species is included.—H. M. Fitzpatrick.

1287. DAVIS, J. J. [Note under "Notes and Brief Articles."] Mycologia 13: 58. 1921.—Records 30 collections of *Pucciniastrum arcticum* from Wisconsin, all on *Rubus triflorus*.—H. R. Rosen.

1288. DIEHL, WILLIAM W. The fungi of the Wilkes Expedition. Mycologia 13: 38-41. 1921.—Attention is called to 8 species of fungi described as new by Berkeley and Curtis, most of which heretofore have been overlooked.—H. R. Rosen.

1289. DUFRENOY, JEAN. The occurrence of *Actinomyces*-like endotrophic mycorrhiza. *New Phytol.* 19: 40-43. *Fig. 1-5.* 1920.—*Actinomyces* is held responsible for 2 cases of endotrophic mycorrhiza. This conclusion demands for proof further investigation of the cases and also a precise definition of the genus *Actinomyces*. Descriptions are given of the morphology and staining reactions of the mycorrhiza.—I. F. Lewis.

1290. FINK, BRUCE, AND SYLVIA C. FUSON. Ascomycetes new to the flora of Indiana. *Proc. Indiana Acad. Sci.* 1918: 264-275. 1920.—The authors list 135 species distributed among 43 families, with host or substratum and county. Many of these Ascomycetes are associated with algae in lichens. Two species, *Pyrenopsis fuscoatra* Fink sp. nov. and *Verucaria sordida* Fink sp. nov., are new.—F. C. Anderson.

1291. FISCHER, L. Tabellen zur Bestimmung einer Auswahl von Thallophyten und Bryophyten. [Keys for the determination of a selected group of thallophytes and bryophytes.] 60 p. Bern, 1918.—This series of keys was prepared for the use of students in the University of Bern. The first edition appeared in 1898 and the second in 1903. After the death of the author, a revised edition was published by his son, E. FISCHER, in 1910, and the present publication is the second edition of the revision. Representatives of the myxomycetes, bacteria, algae, fungi, liverworts, and mosses are included, more attention being given to the fungi than to any other group.—A. W. Evans.

1292. FRIES, THORE C. E. Bidrag til Tromsø Amts gasteromycetflora. [Contribution to the flora of gasteromycetes of Tromsø Amt, Norway.] *Bergens Mus. Aarbok Naturv.* Raekke 1917-18: 10 p. 1920.—Notes on species of Lycoperdaceae and Nidulariaceae. *Calvatia saccata* (Vahl) Morg. var. *alpina* n. var. is given.—A. Gundersen.

1293. GODFREY, G. H. *Sclerotinia Ricini* n. sp. on the castor bean (*Ricinus communis*). *Phytopath.* 9: 565-567. *Pl.* 40-41. 1919.—A hitherto undescribed species of *Botrytis*, causing a serious disease of the castor bean, is shown to be the conidial condition of a species of *Sclerotinia* which is here described as *S. Ricini* n. sp. The *Botrytis* was repeatedly obtained from single ascospore isolations.—H. M. Fitzpatrick.

1294. GROVE, W. B. Mycological notes, V. *Jour. Botany* 58: 249-251. 1920 (continued from *Jour. Botany* 57: 210. 1919, and to be continued).—The writer presents additional notes on *Russula claroflava* Grove, and a revised description of that species. It was found to grow always on grassy ground among trees on the borders of a sphagnum bog. *Boletus sanguineus* Withering was rediscovered by the writer, and a description is given. It is noted that a certain number of closely related species would be better treated as subdivisions of a comprehensive species, e.g., *B. chrysenteron*. *Monilia candicans* Sacc. is redescribed from a specimen obtained in Cofton Park. It is probably the same as *Monilia caespitosa* Relh. about which there has been much doubt. The statement of authors that the spores are in ternate spikes is misleading, as ternate spikes are only occasional. A brief note in correction of "Mycological notes IV" is appended. The corrections concern an unnamed species of *Phyllosticta*, and *Sphaerulina intermixta* f. *valde-evoluta*.—K. M. Wiegand.

1295. HERRMANN, EMIL. Pilzschadlinge an Drogen. [Fungi detrimental to drugs.] *Pharm. Zentralhalle* 61: 95-100. 1920.—A detailed study of the action of various kinds of fungi on drugs. The forms enumerated include Myxomycetes, Peronosporaceae, Perisporiaceae, Ustilaginales, Uredinales, Exobasidiales, and Exoascaceae.—H. Engelhardt.

1296. JONES, FRED RUEL, AND CHARLES DRECHSLER. Crownwart of alfalfa caused by *Urophlyctis alfalfae*. *Jour. Agric. Res.* 20: 295-323. *Pl.* 47-56. 1920 [1921].—Crownwart has been known in the United States for about 10 years. It is still confined to Pacific slope sections and is not a serious disease. *Urophlyctis alfalfae* seems to be limited to *Medicago sativa* and *M. falcata*. The disease originates in infection of very young buds in early spring; the foliar elements of these develop into abnormalities not involving the mature structures of



root or stem. In the presence of abundant moisture, the galls complete development in early summer; most of them decay rapidly but some live over winter. The fungous body consists of turbinate cells and resting spores. At all stages of development of the gall characteristic masses of brown resting spores are present. The first turbinate cell is the immediate development of the infecting body and becomes polynucleate; from this uninucleate peripheral segments are cut off at the apex. A hyphal structure of limited growth develops from each of these; its expanded nucleate termination constitutes the turbinate cell of the next succession. At its mature stage the turbinate cell bears a branched apical haustorium, the axis of which proliferates at its tip a globose expansion into which the polynucleate protoplasm passes to produce the resting spore; the latter is characterized by 9 to 15 branched haustoria zonately arranged, or only by scars of these when ripe. No evidence of any sexual process in the production of these spores was found.—The abundant development of the disease is associated with excessive soil moisture during the infection period and control measures leading to reduction of soil moisture at this time are indicated.—*F. Weiss.*

1297. KEISSLER, KARL VON *Revision des Sauterschen Pilzherbars.* [Revision of Sauter's fungus herbarium.] *Ann. Naturhist. Hofmus. Wien* 31: 77-138. 1917.—There is a list of Sauter's mycological publications and an introduction. The special part consists of 3 subdivisions: (1) A list of Sauter's species based upon types in his herbarium, (2) a list of Sauter's species of which there are no specimens in the herbarium, and (3) a list of species other than Sauter's of which there are specimens in the herbarium. Several herbarium names credited to Sauter are given but are not accompanied by formal descriptions. *Peziza alboflava* Saut. (*Lachnea alboflava* Sacc.) is technically a new combination concerning which there is a note. The list is amply annotated.—*A. S. Hitchcock.*

1298. KOPS, JAN, F. W. VAN EEDEN, EN L. VUYCK. *Flora Batava. Afbeelding en beschrijving der Nederlandsche gewassen.* [Flora Batavia. Illustrations and descriptions of plants of Holland.] Parts 400-401. *Folio, pl.* 1993-2000 [colored]. Martinus Nijhoff: 's-Gravenhage, 1920.—The present parts contain illustrations and descriptions of several vascular and non-vascular plants. The non-vascular plants are: *Inocybe fastigiata* Schaef., *Tricholoma cerinum* P., *Lepiota cinnabarina* Schwein., *Peniophora quercina* Cooke, *Cortinarius (Myzascium) vibratilis* Fr., *Marasmius prasiomus* Fr., and *Clitocybe claviceps* P. [See also Bot. Absts. 1, Entry 635; 5, Entry 2347; 7 Entry 1457; 8, Entry 1541].—*J. M. Greenman.*

1299. LEIBY, R. W. The larger corn stalk borer. *Bull. North Carolina Dept. Agric.* 41<sup>st</sup>: 5-85. 27 fig. 1920.—Several fungus parasites are mentioned in the discussion of the biology of this insect. These include *Isaria barberi* Gd., *Hirsutella* sp., and *Metarrhizium anisopliae* (Metsch.) Sor.—*F. A. Wolf.*

1300. MAYOR, EUGEN. *Notes mycologiques.* [Mycological notes.] *Bull. Soc. Neuchâteloise Sci. Nat.* 42: 62-113. 1916/17 [1918].—Parasitic fungi of Neuchâtel. *Puccinia centaureae-rhapontici* on *Centaurea rhaponticum* is new. *Aecidium* on *Crepis biennis* is connected with *Puccinia pentasiti-pulchellae* Lüdi, and that on *Helleborus foetidus* with *Melampsora abieticaprearum* Tub. [Through Abst. by MATOUSCHEK in *Zeitschr. Pflanzenkrankh.* 30: 147. 1920].—*D. Reddick.*

1301. MEINECKE, E. P. Facultative heteroecism in *Peridermium cerebrum* and *Peridermium harknessii*. *Phytopath.* 10: 270-297. 2 fig. 1920.—Additions to the California host lists of *Peridermium cerebrum* and *Cronartium cerebrum* are reported. Direct infections have resulted from inoculations of several species of pine with aeciospores of *Peridermium cerebrum*. *P. harknessii* Moore retains its ability to produce uredinia and telia on scrophulariaceous hosts, but, in addition, the aeciospores produce galls and aeciospores on the several species of pine tried. The resulting aeciospores germinate like true aeciospores. The heteroecism of *P. cerebrum* and *P. harknessii* is facultative.—*G. Wineland.*

1302. OVERHOLTS, L. O. Some New Hampshire fungi. *Mycologia* 13: 24-37. 1921.—A list of 195 species of fungi under 77 different genera collected mainly by the writer, the Eu-Basidiomycetes being best represented. Hosts or substrata, and locality are given under each species.—H. R. Rosen.

1303. [PENNEL, FRANCIS W.] Index to American mycological literature. *Mycologia* 13: 62-65. 1921.

1304. PUTTEMANS, ARSENE. *Gloeosporium Bombacis*, n. sp. *Bull. Soc. Path. Veg. France* 7: 74-75. 1920.—This fungus was found in the vicinity of Sao Paulo, Brazil, on the bark of young shoots of *Bombax* (*Pachyra*) *insignis*, forming irregular, clear, brown spots later becoming darker. On these spots were found acervuli of what appears to be an undescribed *Gloeosporium*. The bark on the affected shoots becomes light colored and hard. New shoots arise below the diseased ones and these soon become affected with disease. A technical diagnosis of the fungus is given.—C. L. Shear.

1305. RABAK, F. The effect of mold upon the oil of corn. *Jour. Indust. Eng. Chem.* 12: 46-48. 1920.—The spoilage of corn from the growth of mold is noticeably manifested in connection with the fatty oil.—Henry Schmitz.

1306. RAMSBOTTOM, J. Canvas-destroying fungi. *Nature* 105: 563-564. 1920.—War experiences have shown this to be an important question, especially on "flax made" canvas. Short account of investigations by W. BROUGHTON-ALCOCK in Malta, Italy (*Journal of Royal Army Medical Corps*, Dec., 1919), shows species of *Macrosporium* and *Stemphylium* to be principal agents. Variation in color of spots due to representatives of several other genera. Mycelium was found in canvas ready for making into tents, and it is suggested that its development began during the retting process (not found on new cotton canvas). Willesden method (cuprammonium) and "cutch" treatment prevented growth of fungi. Soft soap, 1 to 5000 solution, followed by a mixture of 1 per cent alum and  $\text{CuSO}_4$  greatly inhibited growth and gave good results at Malta. Author states that in Saloniki sodium chromate proved superior to these.—O. A. Stevens.

1307. RAMSBOTTOM, J. [Rev. of: CHURCH, A. H. Elementary notes on the morphology of fungi. *Bot. Mem.* [Oxford] 7. 29 p. 1920.] *Jour. Botany* 58: 181. 1920.

1308. ROBERTS, J. W. *Clitocybe sudorifica* as a poisonous mushroom. *Mycologia* 13: 42-44. 1921.—Detailed symptoms of poisoning due to *Clitocybe sudorifica*, which thus far has been distinguished from *C. dealbata* only by its effects on the mycophagist.—H. R. Rosen.

1309. SALISBURY, E. J. Botany. *Sci. Prog.* [London] 15: 31-34. 1920.—A review of work done on *Actinomyces*.—J. L. Weimer.

1310. SEAVER, FRED J. Fungi [Moulds, blights, and mushrooms], in Britton's "Flora of Bermuda," p. 479-489. 1918.—The author of this chapter presents a general account of the fungi of Bermuda with notes on the various groups and species included. Reference is made to the "Memoirs of the New York Botanical Garden" for August, 1916, where a complete list of the fungi of Bermuda is recorded. No new species of fungi are described in the present volume. [See Bot. Absts. 8, Entries 687, 1320.]-J. M. Greenman.

1311. STAKMAN, E. C., AND L. J. KRAKOVER. *Puccinia graminis* on native *Berberis canadensis*. *Phytopath.* 10: 305-306. 1920.—*Puccinia graminis* was observed for the first time naturally infecting *Berberis canadensis*, the infection being distributed over 8 counties and found spreading to alternate hosts.—E. K. Seymour.

1312. STEVENS, F. L. Perithecia with an interfascicular pseudoparenchyma. *Bot. Gaz.* 68: 474-476. *Pl.* Dec., 1919.—A Porto Rican fungus, collected on *Bromelia pinguin*, shows upon examination a pseudoparenchyma occupying the center of the perithecium, instead



of the usual cavity partially filled by asci and paraphyses. This condition suggests the situation in *Penicillium* or in the Plectascineae, except that here the asci arise at the base of the ascocarp. The fungus therefore is placed in a new genus, *Desmotascus*, and the species is named *D. portoricensis*.—*H. C. Cowles*.

1313. TISDALE, W. B. Iris leaf spot caused by *Didymellina iridis*. *Phytopath.* 10: 148-163. 6 fig. 1920.—The causal fungus, usually known in its conidial state as *Heterosporium gracile*, is traced through its life cycle, and its taxonomy, morphology, and host relationships are considered in detail. The removal of dead infected leaves in spring before new foliage appeared controlled the disease.—*F. R. Jones*.

1314. TORREND, C. Les Polyporacées du Brésil: Polypéracées stipitées. [Stipitate Brazilian polypores.] *Broteria: Ser. Bot.* 18: 121-143. *Pl.* 5-8. 1920.—The article contains a key to the Brazilian genera of stipitate polypores, a discussion of 34 species of the genus *Amuroderma*, and a key for separation of the species. Each species is given a brief technical description in addition to less formal observations. *A. Gusmanianum*, *A. picipes*, and *A. Mosselmanii* are proposed as new. Photogravure plates illustrate the gross characters of 11 species, or varieties.—*E. B. Chamberlain*.

1315. WEIDMAN, FRED D. *Penicillium brevicaulis* var. *hominis* Saccardo 1877, Brumpt and Langeron, 1910, in an American case of ringworm of the toes. *Arch. Dermatol. and Syphilol.* 2: 703-715. *Fig.* 1-14. 1920.

## LICHENS

1316. BACHMANN, E., AND FR. BACHMANN. *Litauische Flechten*. [Lithuanian lichens.] *Hedwigia* 61: 308-342. 1919.—Collections made in vicinity of Lake Narotsch, 55°N., 27°E. First 12 pages devoted to physiographic, climatological, and plant geographic features of the region with observations on the lichen vegetations of different substrata—soils, stones, trees, etc.—The 204 species found are arranged in systematic order and aside from localities there are brief notes on many species. *Acarospora globosa* (Koerb.) is described fully.—Many species which usually are sterile were found fruiting abundantly. Six lichen parasites are mentioned. A comparison with other lichen floras is included.—*D. Reddick*.

1317. DU RIETZ, G. EINAR. Några lavar från det 16:e skandinaviska naturforskarstmötets excursion i Bergens skärgård. [Some lichens from the excursion on the 16th meeting of the Scandinavian naturalists among islands near Bergen.] *Bergens Mus. Aarbok Nat. Raekke* 1917-1918: 26-29. 1920.—An annotated list of species.—*A. Gundersen*.

1318. FINK, BRUCE, AND SYLVIA C. FUSON. *Ascomycetes new to the flora of Indiana*. *Proc. Indiana Acad. Sci.* 1918: 264-275. 1920.—See *Bot. Absts.* 8, Entry 1290.

1319. MERESCHKOVSKY, CONST. *Le Parmelia camtschadalis existe-t-elle?* [Does *P. camtschadalis* exist?] *Hedwigia* 61: 303-307. 1919.—A polemic dedicated to V. P. Savicz. The type is in the herbarium of the Conservatoire Botanique at Geneva.—*D. Reddick*.

1320. RIDDLE, LINCOLN W. *Lichenes*, in Britton's "Flora of Bermuda," p. 470-479. 1918.—The author of this chapter presents in systematic order a general account of the lichens, with brief notes on salient characters of the families and species represented. Reference is made to a previous article on the Bermuda lichen flora in the "Bulletin of the Torrey Botanical Club" for April, 1916, where an enumeration of these lichens is given with descriptions of new species and varieties. [See *Bot. Absts.* 1, Entry 1062; 8, Entries 687, 1310.] —*J. M. Greenman*.

1321. SHIRLEY, JOHN. The thallus of the genus *Parmelia*. *Papers and Proc. Roy. Soc. Tasmania* 1918: 53-68. 1919.

## BACTERIA

1322. ANONYMOUS. [Rev. of: GUERNEY-DIXON, S. *The transmutation of bacteria*. xviii + 179 p. University Press: London, 1919.] *Nature* 105: 131-132. 1920.—“Deals with certain variations, morphological and physiological, which are encountered amongst pathogenic bacteria. \*\*\* mainly a study of bacteriological literature in the English language.”—O. A. Stevens.

1323. ANONYMOUS. [Rev. of: TANNER, F. W. *Bacteriology and mycology of foods*. vi + 592 p. John Wiley & Sons, New York, Chapman & Hall, London: 1919.] *Sci. Prog.* [London] 15: 160. 1920.

1324. B[ERGEY], D. H. [Rev. of: HORT, EDWARD C. *The reproduction of aerobic bacteria*. *Jour. Hygiene* 18: 369-408. Pl. 4-7. 1920.] *Absts. Bact.* 4: Entry 893. 1920.—Hort’s definition of involution forms of bacteria (“An involution form of bacterium can only mean a bacterium which is undergoing retrogressive, or perhaps, degenerative changes. It is strictly speaking, a sterile organism which is not only incapable of maintaining its reproductive activity, but is also incapable of maintaining its integrity of form.”) is at variance with the usual conception of what is meant by the term involution form as it includes also what is commonly meant by the term degeneration form. Hort studied *Bacillus typhosus* in 4 per cent glucose broth and 4 per cent glucose agar. These media are too high in sugar and become too acid for normal nutrition. “Any opinion formed on the modes of reproduction of bacteria when placed under such abnormal conditions must be accepted with great caution.” Hort’s conclusion that bacteria multiply not only “by the simple process of transverse binary fission into two equal parts,” but that “under certain circumstances the lower bacteria are able to reproduce themselves by the production of fertile branches and buds, and by endogenous production of gonidial bodies, in addition to the more familiar method of equal binary fission,” is questioned because “it is evident that any alteration of the osmotic tension of culture media will affect the normal process of fission, but these abnormal figures, which everyone has seen, should not be regarded as being modes of reproduction as Hort believes, but rather, abortive attempts of fission.” [See also Bot. Absts. 8, Entry 1328.]-D. Reddick.

1325. CONN, H. J., AND R. S. BREED. A suggestion as to the flagellation of the organisms causing legume nodules. *Science* 51: 391. 1920.—For some time there has been dispute as to whether legume nodule organisms have 1 or several flagella. BURRELL and HANSEN claimed that they were monotrichic, whereas various others have observed peritrichic flagella. HANSEN now says that he, too, has found peritrichic flagella in cultures from clover, vetch, and alfalfa. Hence he suggests that there may be 2 different groups. The question is raised by the authors whether the cowpea and soy bean organisms may not be monotrichic in young cultures and peritrichic when they are older.—A. H. Chivers.

1326. ELLIS, DAVID. Iron-depositing bacteria. [Rev. of HARDER, EDMUND CECIL. *Iron depositing bacteria and their geologic relations*. U. S. Geol. Surv. Professional Paper 113. 89 p., pl. 1-12, fig. 1-14. 1919.] *Nature* 105: 727. 1920.

1327. H., R. T. [Rev. of: ELLIS, D. *Iron bacteria*. xix + 179 p., 5 pl. Methuen and Co.: London, 1919.] *Nature* 105: 323. 1920.

1328. HORT, EDWARD C. *The cultivation of aerobic bacteria from single cells*. *Jour. Hygiene* 18: 361-368. 1 fig. 1920.—Each of the present methods of isolating single cells (Indian ink, squared coverslip, capillary tube, droplet, and Barber methods) is unsatisfactory. Objections to each method are stated.—For immersion lens examination the following method is found effective: Etch small rings on coverslips; sterilize slips and slides; spread a thin layer of agar on the slides; prepare a dilute culture and place the smallest possible droplet of it in the center of a ring; invert slips on the slide and examine to see whether a single cell is present or not; slides bearing a single organism are incubated and examined at fre-



quent intervals until a colony has developed from which tube cultures may be secured.—When the object is simply to secure a pure culture from a single cell the following method is used: Spread hot nutrient agar over sterilized glass slides; when cool, inoculate from a dilute culture by means of a glass rod; cover the agar with a thin sheet of perforated celluloid; place sterilized coverslips over the perforations and incubate; examine the circlelets of medium in the minute moist chambers until one is found which contains a single cell; center the colony in the field, replace the lens with an accurately centered needle (method described), touch the colony, and transfer in the usual way; examine to see that the colony has been touched. [See also Bot. Absts. 8, Entry 1324.]-D. Reddick.

1329. HORT, EDWARD C. **The reproduction of aerobic bacteria.** Jour. Hygiene 18: 369-408. Pl. 4-7. 1920.—A culture of *Bacillus typhosus* was secured from a single cell and studied in 4 per cent glucose broth or 4 per cent glucose agar. Numerous types of organisms, which are illustrated, developed in the cultures. This supports conclusions previously published that the lower bacteria are able to reproduce themselves "by the production of fertile branches and buds, and by the endogenous production of gonidial bodies, in addition to the more familiar method by equal binary fission." These are not regarded as involution forms. The latter are defined as "strictly speaking, a sterile organism which is not only incapable of maintaining its reproduction activity, but is also incapable of maintaining its integrity of form."—Part 2 (p. 382 to 407) is entitled "the effect of the reproductive life of bacteria on the agglutinability of bacterial emulsions." [See Bot. Absts. 8, Entry 1324.]-D. Reddick.

1330. KAWAKAMA, KOICHIRO, AND SUEHIRO YOSHIDA. **Bacterial disease on Milletia plant.** (*Bacillus milletiae* n. sp.) Bot. Mag. Tôkyô 34: 110-115. Pl. 2. 1920.—See Bot. Absts. 7, Entry 1190.

1331. KOSER, STEWART A. **A bacteriological study of canned ripe olives.** Jour. Agric. Res. 20: 375-379. 1921.—In a bacteriological examination of 480 commercial containers of ripe olives, living microorganisms were found in practically every sample which showed either a "swelled" condition or had a bad odor. Sixteen different kinds of organisms were found. Bacteria were commonest, members of the colon group predominating.—Viable organisms were found in a small percentage of containers which were "normal." "These were either aerobic, spore-forming bacilli, cocci or apparently dormant members of the colon group."—D. Reddick.

1332. LÖHNIS, F., AND ROY HANSEN. **Nodule bacteria of leguminous plants.** Jour. Agric. Res. 20: 543-555. Pl. 68-69. 1921.—The nodule bacteria of leguminous plants can be divided into 2 groups. Each group is distinct, morphologically as well as physiologically. The bacteria of the 1st group, which the authors consider to be *Bacillus radicola* Beijerinck, are peritrichic, grow with relative rapidity on agar plates, and produce very characteristic changes in milk. They produce nodules on the roots of the following plants: Clover, sweet clover, alfalfa, vetch, pea, navy bean, lupine, black locust, *Amorpha*, and *Strophostyles*. The bacteria of the 2nd group are monotrichic, grow slowly on agar plates, and cause no marked change in milk. They have been isolated from cowpea, soybean, peanut, beggar weed, *Acacia*, *Genista*, and *Cassia*. The nomenclature of this latter group is discussed. *Bacillus radiobacter* Beijerinck isolated from legume nodules was studied with the 2 groups of nodule forming bacteria.—W. H. Burkholder.

1333. MILLER, H. M. **Modification of the Howard method for counting yeasts, spores and bacteria in tomato products.** Jour. Indust. Eng. Chem. 12: 766. 1920.—The modification described is based on the fact that by boiling tomato pulp with Loeffler's methylene blue and Tiehl-Neilsen's carbolfuchsin the microorganisms are stained a slightly deeper color than the tomato tissues.—Henry Schmitz.

1334. TRUFFAUT, G., ET N. BEZSSONOFF. **Sur les caracteres communs au Bacterium  $\beta$ , symbiote du Clostridium Pastorianum de Winogradsky, et au B. aliphaticum non liquefaciens**

de Tausz et Peter. [On the characters common to *Bacterium*  $\beta$ , the symbiont of *Clostridium* *Pastorianum* of Winogradsky and *Bacterium* *aliphaticum non liquefaciens* of Tausz and Peter.] Compt. Rend. Acad. Sci. Paris 171: 1089-1091. 1920.—A comparison is made between the morphological and physiological characteristics of *Bacillus*  $\beta$ , which is a symbiont of *Clostridium pastorianum*, with those of *Bacillus aliphaticum non-liquefaciens*. The conclusion is reached that they are either closely related strains of the same species or that they are the same strain. The chief points of distinction seem to be such as are related to the life habits of the two, symbiosis in the one case and independent development in the other.—C. H. Farr.

1335. WINSLOW, C.-E. A., JEAN BROADHURST, R. E. BUCHANAN, CHARLES KRUMWIEDE, JR., L. A. ROGERS, AND G. H. SMITH. The families and genera of the bacteria. Final report of the committee of the Society of American Bacteriologists on characterization and classification of bacterial types. Jour. Bact. 5: 191-229. 1920.—The report is divided into 4 sections. In section I, the introduction, reference is made to the preliminary report of the Committee in 1917 and the changes made in that report are noted, namely, (1) the family *Mycobacteriaceae* has been elevated to the rank of an order, *Actinomycetales*, with 2 families, *Actinomycetaceae* and *Mycobacteriaceae*; to the first family have been added 2 genera, *Actinobacillus* and *Erysipelothrix*, the genus *Nocardia* having been omitted; to the second family has been added the genus *Pfeifferella*. (2) The family *Nitrobacteriaceae* has been divided into 2 tribes and the name of the genus *Mycoderma* has been changed to *Acetobacter*. (3) In the *Coccaceae* the genus *Neisseria* has been placed in a separate tribe; the genus *Albococcus* is united with *Staphylococcus*; and the new genera *Diplococcus* and *Leuconostoc* are added. (4) The *Bacteriaceae* are divided into 7 tribes and the new genera *Erythrobacillus*, *Chromobacterium*, *Zopfius*, and *Proteus* are added. (5) The family *Lactobacillaceae* is reduced to the rank of a tribe of the *Bacteriaceae*. In section II are given some specific recommendations, including a list of 16 genera the names of which are recommended for adoption. In section III is given the outline of bacterial classification, including characteristics of the orders, families, tribes, and genera; 38 genera are included with the name of the type species for each genus. Section IV contains an artificial key to the families and genera. Section V consists of a generic index of the commoner forms of bacteria with the names of the common species annexed to their proper generic names.—Chester A. Darling.

## PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. BERRY, *Editor*

(See also in this issue Entries 1088, 1101)

1336. BERRY, E. W. Contributions to the Mesozoic flora of the Atlantic Coastal Plain XIV. Tennessee. Bull. Torrey Bot. Club 48: 55-72. 1921.—An account of a flora of 135 species of plants recently discovered in the Ripley formation of western Tennessee. The Ripley formation is the latest of the Upper Cretaceous formations of the Mississippi embayment region. The report includes an account of the botanical character, the probable environment, and the correlation of the flora, and gives a list of the forms represented.—E. W. Berry.

1337. HARSHBERGER, J. W. Upper Cretaceous floras. [Rev. of: BERRY, E. W. Upper Cretaceous floras of the eastern gulf region in Tennessee, Mississippi, Alabama and Georgia. U. S. Geol. Surv. Prof. Paper 112. 178 p., 33 pl. 1919 (see Bot. Absts. 3, Entry 1600).] Bot. Gaz. 68: 482-483. 1919.

1338. HEIM, ARNOLD, AND H. GAMS. Interglaziale Bildungen bei Wildhaus (Kt. St. Gallen). [Interglacial deposits at Wildhaus (Canton St. Gall).] Vierteljahrsschr. Naturf. Ges. Zurich 63: 19-33. 1918.—The author gives lists of fossil plants contained in the deposits.—John H. Schaffner.



1339. JENNINGS, O. E. Fossil plants from the beds of volcanic ash near Missoula, western Montana. Mem. Carnegie Mus. 8: 385-450. Pl. 22-33. 1920.—The author describes collections made in 1902 and 1905 by EARL DOUGLAS from near Missoula and near Winston in western Montana. The latter is small and the material represents new species of *Equisetum* and *Aralia* but is believed to be the same age as the larger and better preserved collection from the former locality. This includes 21 species, i.e., *Sequoia* 2, *Thuyopsis*, *Sabina*, *Typha*, *Cyperacites*, *Populus* 2, *Juglans*, *Betula*, *Alnus* 2, *Quercus* 3, *Ficus* ?, *Ilex*, *Celastrus*, and *Vaccinium*. Species of *Sequoia*, *Juglans*, *Betula*, *Alnus*, *Quercus*, *Ficus* ?, *Ilex*, *Oelastrus*, and *Vaccinium* are described as new.—This flora is regarded as of Oligocene age and as existing around a mountain lake. There is an ecological discussion in which the fossil flora is compared with those of recent lakes in the Montana Rockies, and it is concluded that the Oligocene climate in that region was somewhat warmer than now prevails in that region, and that the plant associations represented ranged from wet meadow to moderately xerophytic oak forests on sandy or rocky lake shores.—E. W. Berry.

1340. JOHNSTON, R. M. Notes on the discovery of a new fossil fruit from the Deep-Lead Tin Drifts at Derby, Tasmania. Papers and Proc. Roy. Soc. Tasmania 1918: 9-10. 1919.—This article reports the discovery of a lignified fossil fruit possibly allied to *Plesiocapparis prisca* F. von Mueller. It is described by the author as a new species under the name *Carpolithes (Plesiocapparis) Clarkii*.—J. H. Faull.

1341. POTONIE, R. Mitteilung über mazerierte kohlige Pflanzenfossilien. [Notes on the maceration of carbonized plant fossils.] Zeitschr. Bot. 13: 79-89. 12 fig. 1920.—The author describes and figures vertical sections of the stomata of *Thinnfeldia rhomboidalis* Schenk from the Lias (lower Jurassic) of Germany, calling attention to their xerophytic character; the technique of maceration and staining of the fossils is discussed. A specimen of *Callipteris conferta* (Sternberg) Brongniart is described from the Permian (Rothliegendes) of Thuringia which shows that it had been mined by some insect larva.—E. W. Berry.

1342. STOPES, MARIE CARMICHAEL. The missing link in Osmundites. Ann. Botany 35: 55-64. Pl. 2, 1 fig. 1921.—A specimen of *Osmundites* from Queensland, Australia, consisting of a piece of rhizome with surrounding leaf bases, was found to have a solid protostele in the stem. All the other features are typical of the genus including the meristeles in the leaf bases. KIDSTON and GWYNNE-VAUGHAN had concluded that the vascular system of the Osmundaceae must have been derived from just such a protostele though no form possessing one was known to them. The specimen described is regarded as the missing form. The plant is given the name *Osmundites Kidstoni*. The horizon is probably Cretaceous.—W. P. Thompson.

1343. TORREY, R. E. Telephragmoxylon and the origin of wood parenchyma. Ann. Botany 35: 73-78. Pl. 3, 3 fig. 1921.—A lignite of Araucarian affinities from the Cretaceous of Texas shows at the end of the annual ring numerous tracheids which are divided into segments. This is considered to be the first stage in the evolution of wood parenchyma from tracheids. The specimens are placed in a new genus *Telephragmoxylon*.—W. P. Thompson.

## PATHOLOGY

G. H. COONS, *Editor*

C. W. BENNETT, *Assistant Editor*

(See also in this issue Entries 775, 776, 806, 1026, 1061, 1077, 1095, 1272, 1273, 1275, 1276, 1277, 1279, 1280, 1282, 1293, 1296, 1299, 1301, 1303, 1304, 1311, 1313, 1316, 1328, 1497, 1536)

## PLANT DISEASE SURVEY; REPORTS OF DISEASE OCCURRENCE AND SEVERITY

1344. DANA, B. F., AND GEORGE L. ZUNDEL. A new corn smut in Washington. Phytopath. 10: 328. 4 fig. 1920.—The writers note occurrence at Pullman, Washington, of a new

corn smut identical with head smut of sorghum (*Sphacelotheca reiliana*). Symptoms are given in detail.—W. H. Tisdale.

1345. FIGUEROA, C. A. The mottling disease of cane and the sugar production of Porto Rico. Jour. Dept. Agric. Porto Rico 3<sup>4</sup>: 35-41. 1919 [1920].—"Where the infection is most intense the sugar production has diminished most heavily." Statistics are presented of the cane acreage and amount of sugar manufactured in Porto Rico in the crops of 1917 to 1919. In Cayey, where the disease is most severe the acreage of 1918 and 1919 was nearly double that of 1917 but the production of sugar was reduced 50 per cent. For the whole island, on the basis of the crop of 1917, the reduction is 30 per cent.—D. Reddick.

1346. HAMBLIN, C. O. Downy mildew of the vine. Agric. Gaz. New South Wales 32: 49-50. 3 fig. 1921.—Grape downy mildew was first observed in New South Wales in 1918. The disease appears early in the season but may not make much headway. It overwinters by spores and probably also by hyphal filaments. Notes on control are given.—L. R. Waldron.

1347. LINDFORS. [Rev. of: HENNING, ERNST. Anteckningar om gulrosten. [Aufzeichnungen über den Gelbrost.] Centralanst. Försöksv. p. Jordbruksområdet Medd. 192. 1919.] Zentralbl. Ges. Landw. 1: Entry 731. 1920.—Henning's continuation of the list of ERIKSSON and HENNING (*Die Getreideroste*) on yellow rust years, contains an incorrect statement. On page 10, 3rd line from the bottom for "salweizen, Boreweizen," read "Landweizen." Footnote 2 should be struck out.—D. Reddick.

1348. MACKIE, W. W. Head smut in sorghum and maize. Phytopath. 10: 307. 1920.—Author notes occurrence of head smut (*Sorosporium reilianum*) of sorghum, and smut of corn in California.—W. H. Tisdale.

1349. STILLINGER, C. R. Apple black rot (*Sphaeropsis malorum*) in Oregon. Phytopath. 10: 453-458. 1920.—The first report of *Sphaeropsis malorum* from Oregon and probable occurrence in Washington and California. The fungus is of small economic importance in orchard and storage. Morphological and physiological studies show the necessity of study of strains of *Sphaeropsis* and *Diplodia*.—R. B. Streets.

1350. THOMAS, C. C. Coix smut. Phytopath. 10: 331-333. 1 fig. 1920.—Coix smut (*Ustilago coicis* Bref.) is reported in this country for the first time on plants of *Coix lachryma jobi* grown from seed sent from the Philippine Islands.—G. Wineland.

1351. TUBEUF, C. VON. Einbruch der Kiefern-mistel nach Bayern von Süden. [The invasion of Bavaria from the south by the pine mistletoe.] Naturw. Zeitschr. Forst- u. Landw. 18: 230-232. 1920.—In July 1919, an outbreak of mistletoe on pine was discovered on the southeast slope on the right hand bank of the Loisach between Eschenlohe and Oebrau. In June of 1920, another infected area was discovered on the east side (west exposure) of the Loisach valley between Garmisch and Eschenlohe. The Alps have previously offered an effective barrier to the mistletoe, and there is little doubt but that the parasite was carried across by the thrush. Tubeuf suggests that the infected areas be gone over and the mistletoe removed and destroyed while the infection is still small; further spread would greatly increase the work of suppression. The invasion by this mistletoe resembles that of *Loranthus* of oak, which was brought up from Bohemia through the Elbe Valley by thrushes into Saxony, and is at present unwisely protected by law.—J. Roesser.

1352. WEIMER, J. L. The distribution of buckeye rot of tomatoes. Phytopath. 10: 172. 1920.—This disease, caused by *Phytophthora terrestris*, occurred at Arlington, Virginia, in 1919. The known range northward is thus considerably extended.—W. G. Stover.



## THE PATHOGENE (BIOLOGY; INFECTION PHENOMENA; DISPERSAL)

1353. FAWCETT, H. S. *Pythiacystis* and *Phytophthora* (on Citrus). *Phytopath.* 10: 397-399. 1920.—Cultures obtained from fruit and diseased bark of one type of gummosis of citrus in California were mostly *Pythiacystis citrophthora* Sm. and Sm.; cultures made from diseased bark of "footrot" from various sources all gave *Phytophthora terrestris* Sherbakoff. *Pythiacystis*-like forms were obtained from other hosts in California.—R. B. Streets.

1354. HEDGCOCK, GEORGE G., AND N. REX HUNT. Notes on *Peridermium harknessii*. *Phytopath.* 10: 395-397. 1920.—Field observations of the spread of the aecial stage of *Peridermium harknessii*, apparently without the aid of the telial host, are confirmed by experiments with several species of pine in which a true aecial stage follows inoculation with aeciospores.—G. Wineland.

1355. JAGGER, IVAN C. *Sclerotinia minor*, n. sp., the cause of a decay of lettuce, celery, and other crops. *Jour. Agric. Res.* 20: 331-333. *Pl.* 59, 1 fig. 1920 [1921].—A technical description of *S. minor* with illustrations of apothecia, ascospores, and microconidia. Apothecia and sclerotia of *S. libertiana* are much larger. The fungus causes a decay of lettuce and other plants similar to that produced by *S. libertiana*. It is known to occur in Massachusetts, New York, Pennsylvania, and Florida.—D. Reddick.

1356. MATZ, J. Infection and nature of the yellow stripe disease of cane (mosaic, mottling, etc.). *Jour. Dept. Agric. Porto Rico* 34: 65-82. 1919 [1920].—Cuttings from cane showing mosaic were used for propagating purposes. New shoots from such pieces invariably showed symptoms of the disease. The canker stage of mosaic has been secured in as short a time as 3 months.—Transmission experiments by contact failed. Hypodermic injections of juice from diseased plants gave infection in 4 cases of over 200 trials.—Histological studies of diseased and healthy plants were made. "It seems that a foreign plasmodium-like substance is apparently present in the cells of the yellow-striped cane leaf and the stem tissue." This plasmic substance is more constantly present and in a more defined form in cankered cane stalks. It is associated with reddish streaks that may be seen on the interior of severely affected cane. The plasma mass becomes granular in cut pieces and "after eight days motility was observed in the plasma mass." The substance resembles a plasmodium.—D. Reddick.

1357. PELTIER, GEORGE L. The influence of temperature and humidity on the growth of *Pseudomonas citri*, and of its host plants, and on infection and development of the disease. *Jour. Agric. Res.* 20: 295-323. *Pl.* 47-56. 1920 [1921].—The temperature relations of *P. citri*, in culture, are similar to other pathogenes of the *Pseudomonas* group. The factor of time should receive more consideration. When it is considered, the critical temperature in degrees Centigrade are as follows: Minimum, 5; optimum, between 20 and 30; maximum, about 35; thermal death point, between 49 and 52.—Humidity has little or no influence on the viability of the organisms at low temperatures but at high temperatures it is the limiting factor. With medium humidities "at all temperatures, the organism is viable for the period of the experiment." "Some factor or factors, other than the rapidity of drying, are responsible for these results."—Citrus plants under controlled conditions vary markedly in their reaction to temperature and humidity, especially at low and at high temperatures. The optimum temperature for the plants used lies between 20 and 30°C. This condition, with slight variations, also prevails in the field.—Infection depends on 3 conditions: Free moisture on the host, suitable temperature, host in actively growing condition. The organism is active in the tissue so long as the host cells are active. When the host is forced into dormancy the organism becomes inactive. The "period of initial infection" is defined as the time required by the pathogene after it reaches the host to enter the stomates or tissues about a wound. This may occur on plants which are not growing actively. The "period of incubation" extends from the time of initial infection until there is visible evidence of disease. This period therefore depends on the conditions of the host at the time of, and immediately following, initial infection. Frequency of rainfall and the temperature each in a dual relation determine

the number of infections, the length of incubation, and the severity of the disease.—Environmental conditions play an exceedingly important rôle in the susceptibility and resistance of citrus plants to canker and “the results indicate that it will be necessary to study the behavior of the host plant to its environment and its relation to the causal organism before any scientific selection or breeding for disease resistance can be made.”—Pertinent literature is reviewed and a bibliography of 17 titles is appended.—*D. Reddick.*

1358. Rands, Frederick V., and Lillian C. Cash. Some insect relations of *Bacillus tracheiphilus* Erw. Sm. *Phytopath.* 10: 133–140. 1920.—A few striped cucumber beetles were found carrying the wilt organism internally during the winter. Infection may occur from the mouth parts of wilt-fed beetles for a time after feeding and also when the feces of the same beetles come in contact with fresh leaf injuries involving the vascular system. The organism has been isolated from the viscera of wilt-fed beetles.—*S. P. Doolittle.*

1359. Rands, Frederick V., and W. Dwight Pierce. A coordination of our knowledge of insect transmission in plant and animal diseases. *Phytopath.* 10: 189–231. 1920.—The writers present a review of the literature dealing with insect transmission of plant and animal diseases, with particular reference to diseases of plants. A distinct correlation is found in the principles which apply to insect transmission in both branches of pathology. Insects may act in 3 general relations to diseases caused by micro-organisms: (1) External transmission in which the infective principle is carried on the external body parts of the insect; (2) insects without carrying infection themselves may cause wounds through which parasite organisms gain entrance; (3) internal transmission in which the organism is taken up and passed unharmed through the body of the insect. The transmission of various fungous, bacterial, and “virus” diseases is reviewed in these relations.—*S. P. Doolittle.*

1360. Sauvageau, C. Sur le parasitisme d'une algue rouge. (*Polysiphonia fastigiata* Grev.) [Concerning the parasitism of a red alga.] *Compt. Rend. Acad. Sci. Paris* 169: 1383–1386. 1919.—Certain marine algae support a varied and abundant flora while others do not. The plants attached to them may be classified as epiphytes or parasites. Most of the endophytic algae are restricted to one host plant or to a relatively small number of host plants. *Polysiphonia fastigiata* is found in dense tufts attached to *Ascophyllum nodosum*, and although it has been described as being merely an epiphyte, the author finds that its structure and development indicate that it is a true parasite. It is rarely found attached to *Fucus platycarpus* and *F. vesiculosus*.—*V. H. Young.*

1361. Smyth, E. Graywood. Insects and mottling disease. *Jour. Dept. Agric. Porto Rico* 3<sup>4</sup>: 83–116. 1919 [1920].—The insects which might be associated with the transmission and spread of sugar cane mosaic are described. A “summary of our knowledge of insect-borne diseases of plants occurring in America” is presented in tabular form and includes 18 diseases. Experimental methods are described and experiments with the different species are presented in detail. Infection has been secured on 6 plants. The agents concerned are West Indian cane fly (*Stenocranus saccharivorus*), leaf scale (*Pulvinaria iceryi*), yellow cane aphid (*Sipha flava*), and mealy bugs (*Pseudococcus calceolariae* and *P. sacchari*). A bibliography of insect-borne diseases of plants comprising 53 titles is appended.—*D. Reddick.*

1362. Smyth, E. Graywood. An annotated bibliography of Porto Rican cane insects. *Jour. Dept. Agric. Porto Rico* 3<sup>4</sup>: 117–134. 1919 [1920].—Brief abstracts of literature, prepared in connection with work on insect transmission of sugar cane mosaic, are presented. [See also preceding entry.]—*D. Reddick.*

1363. Smyth, E. Graywood. List of the insects and mite pests of sugar cane in Porto Rico. *Jour. Dept. Agric. Porto Rico* 3<sup>4</sup>: 135–150. 1919 [1920].—The paper, prepared in connection with a study of insect transmission of sugar cane mosaic, gives for each organism the name, distribution, food plants, injury done, enemies and method of control. [See also the 2 preceding entries.]—*D. Reddick.*



1364. SNELL, W. H. Observations on the distance of spread of aeciospores and urediniospores of *Cronartium ribicola*. *Phytopath.* 10: 358-364. 1920.—The writer records field observations in Wisconsin and New York on natural infections of pine and *Ribes*. He concludes that aeciospores can be blown more than  $1\frac{1}{4}$  miles to infect *Ribes*. Dry weather in New York prevented a wide distribution of the disease by urediniospores.—C. J. Humphrey.

1365. TUBEUF, C. VON. [Rev. of: CLINTON, G. P., AND FLORENCE A. McCORMICK. Infection experiments of *Pinus strobus* with *Cronartium ribicola*. Connecticut (New Haven) Agric. Exp. Sta. Bull. 214. 428-469, pl. 37-43. 1916-1918 (see Bot. Absts. 6, Entry 225).] *Naturw. Zeitschr. Forst- u. Landw.* 18: 236-237. 1920.—The reviewer calls attention to his previous contributions on the same subject. He briefly reviews and criticizes the authors' conclusions on the methods of attack of the fungus, and its external manifestations on the foliage.—J. Roeser.

1366. WALKER, J. C., AND W. B. TISDALE. Observations on the seed transmission of the cabbage black rot organism. *Phytopath.* 10: 174-177. 1920.—A large percentage of cabbage plants grown from imported seed developed black rot (*Bacterium campestris*). When seed of the same lot was treated with mercuric chloride, the disease was practically eliminated.—S. P. Doolittle.

### THE HOST (RESISTANCE, SUSCEPTIBILITY; MORBID ANATOMY AND PHYSIOLOGY)

1367. ARTSCHWAGER, ERNST F. Pathological anatomy of potato blackleg. *Jour. Agric. Res.* 20: 325-330. *Pl.* 57-58. 1920 [1921].—Material for study was taken in arid part of Colorado, U. S. A. Plants affected with black leg show an increase in strongly lignified vascular tissue and a transformation of most of the parenchyma cells of cortex and pith into sclereids. Protein crystals occur in the cells of leaves of affected plants; in healthy plants they have been observed only in peripheral cells of the cortex in tubers.—D. Reddick.

1368. COLLINS, J. FRANKLIN. Notes on the resistance of chestnut to blight. *Phytopath.* 10: 368-371. 2 fig. 1920.—Results of observations indicate that the American chestnut (*Castanea dentata*) is developing resistance to blight. The author describes a case in which a young chestnut shoot apparently recovered from the disease.—Ruth G. Bitterman.

1369. COLON, E. D. The absorption spectrum of the chlorophyll in yellow-striped sugar-cane. *Jour. Dept. Agric. Porto Rico* 34: 43-46. 1919 [1920].—Leaves from healthy plants and from plants affected with mosaic were used. The absorption spectra from alcoholic solutions of chlorophyll from the two kinds of leaves were alike. "Although the tests above described were not as numerous nor performed with as many solvents as might have been desirable, they warrant the belief that the disappearance of the pigment in yellow-stripe is not primarily due to a decomposition of chlorophyll as such."—D. Reddick.

1370. EARLE, F. S. The years experience with sugar-cane mosaic or stripe disease. *Jour. Dept. Agric. Porto Rico* 34: 3-33. 1919 [1920].—An account is given of the lines of activity in Porto Rico since October, 1918, in the study of mosaic. An historical résumé of previous work, with comments upon the researches presented in the same journal by others, is presented. In some cases the comments are more specific or more detailed than those presented by the authors. [See Bot. Absts. 8, Entries 1345, 1356, 1361, 1369, 1378].—D. Reddick.

1371. EDSON, H. A. Vascular discoloration of Irish potato tubers. *Jour. Agric. Res.* 20: 277-294. 1920 [1921].—Vascular discoloration of stem-end tissues of Irish potato tubers is not proof of the presence of parasitic fungi. Discolored bundles often are sterile and fungi frequently are isolated from tissues which appear normal.—Out of 3,203 attempts, by plating, to isolate fungi from tubers, all but 161 of which were discolored, 1,352 gave no growth.

In those yielding growth, many organisms were found: Species of *Fusarium*, 720 times; *Alternaria*, 615 times; bacteria, 241 times; *Verticillium*, 147 times; *Penicillium*, 104 times; *Colletotrichum*, 91 times; *Rhizoctonia*, 12 times; miscellaneous, 87 times.—Field trials in Colorado with tubers from widely separated sources indicate that neither vascular discoloration nor fungous invasion of the tissues of the mother tuber is a guaranty of disease in the resulting plants; nor is their absence a guaranty of health. The soil and not the tuber is the more potent source of disease.—Stem-end pieces used for planting yielded slightly higher percentages of diseased plants than did eye-end pieces. Plants showed a marked capacity for recuperation, which varied with the variety, environment, and with the interaction of the two.—*D. Reddick*.

1372. FRACKER, S. B. Varietal susceptibility to false blossom in cranberries. *Phytopath.* 10: 173-175. 1920.—A tabular presentation and brief discussion of varietal susceptibility. The cultural conditions are given, together with inspection practices and control measures.—*R. B. Streets*.

1373. GUYTON, T. L. The chrysanthemum gall midge. *Ohio Agric. Exp. Sta. Bull.* 341. 103-114, 6 fig. 1920.

1374. HAHN, GLENN G., CARL HARTLEY, AND ARTHUR S. RHODES. Hypertrophied lenticels in the roots of conifers and their relation to moisture and aeration. *Jour. Agric. Res.* 20: 253-265. *Pl.* 44-46. 1920 [1921].—Unusual excrescences on the roots of 10 species of *Pinus*, 4 of *Picea*, and of *Abies balsamea*, *Tsuga canadensis*, *Larix laricina*, *Taxus cuspidata*, *T. brevifolia*, and *Araucaria bidwellii*, are found to have the structure of lenticels, much enlarged. They occur and were produced in various kinds of soil in the presence of excessive soil moisture. Hypertrophy occurs on both weak and vigorous plants. It is decreased by top pruning and is increased by root injury.—The literature is reviewed. The belief that excessive soil moisture stimulates lenticel hypertrophy mainly by increasing general sap pressure, and that oxygen hunger is of no importance as a stimulus, is not supported by these experiments. A bibliography of 23 titles is appended.—*D. Reddick*.

1375. HURD, ANNIE MAY. Injury to seed wheat resulting from drying after disinfection with formaldehyde. *Jour. Agric. Res.* 20: 209-244. *Pl.* 36-41. 1920 [1921].—Results of investigations on the post-treatment action of formaldehyde on wheat are recorded. The major conclusion reached is that injury results from the drying of grain treated with formaldehyde solution; that seed wheat is uninjured by a 0.1 per cent solution (1-40) and, if kept moist, may be held indefinitely without injury unless attacked by molds. Neither a 0.1 per cent (1-40) nor a 0.2 per cent (1-20) solution of formaldehyde produces injury if the wheat is germinated immediately. Injury to dried grain is cumulative. Paraformaldehyde is deposited on dried grain, and the gas formed by the volatilization of this solid penetrates the wheat slowly, probably going into solution in the pericarp. The manner of drying and the moisture content of the atmosphere surrounding the grain determine the nature and extent of injury. An atmospheric humidity of over 70 per cent during the storage period prevents injury; one of 70 per cent or less permits injury, which is most severe in the intermediate humidities, gradually decreasing in the lower ones. Treated grain stored in an absolutely dry chamber is almost uninjured. It is considered probable that the formaldehyde does not enter the wheat as a gas or in the solid polymeric form, but in solution in the seed coats. An optimum atmospheric humidity to permit, first, the formation of paraformaldehyde, and, second, the solution of formaldehyde gas in the grain, results in maximum injury from drying after treatment. Injury is minimized by spreading the wheat as it dries so that maximum aeration occurs. Washing the grain with water immediately after treatment entirely prevents post-treatment injury from dry storage.—*L. M. Massey*.

1376. KELLEY, W. P., AND A. B. CUMMINGS. Composition of normal and mottled citrus leaves. *Jour. Agric. Res.* 20: 161-191. 1920 [1921].—Lemon, orange, and grapefruit leaves are similar in composition. As growth of normal orange leaves proceeds the percentages of



potassium and phosphorus, when expressed on the basis of either the ash or the dry matter, and of nitrogen in the dry matter, decrease; the percentages of calcium, however, increase. The concentration of iron is greater in very young leaves, later decreasing slowly. The concentration of the different constituents probably remains practically constant throughout the period of normal maturity. Notable amounts of potassium and nitrogen are translocated back into some portion of the tree as the leaves approach senility just preceding the time of normal dropping. A part of the phosphorus also appears to be removed from the leaf some time preceding normal maturity. The absolute content of magnesium does not decrease as maturity approaches. Maximum amounts of potassium, phosphorus, and nitrogen are contained in orange leaves by the time they are about 6 weeks of age. The absolute content of calcium continues to increase until full maturity is reached. The highly calcareous nature of the orange leaf is its most pronounced characteristic, the dry matter of the mature leaf containing 5-6 per cent of calcium.—The composition of mottled citrus leaves differs from that of normal leaves mainly in that the calcium content is smaller and the potassium, phosphorus, and usually the nitrogen contents are greater. The composition of mottled orange leaves resembles that of immature leaves, although the percentages of ash and nitrogen in the former are materially greater than in the latter. The sap of normal orange leaves becomes increasingly concentrated and acidic, and when mature is especially rich in calcium. The sap of mottled leaves contains sub-normal amounts of calcium and concentrations of potassium and phosphorus fully twice as high as in mature normal leaves. Abnormally large amounts of unionized acids occur in mottle-leaf sap. The composition of leaf spurs of severely mottled trees varies from the normal in much the same way as the leaves; that of the older wood is more nearly normal. The roots appear to contain considerably less than normal amounts of potassium and phosphorus but an approximately normal amount of calcium. The abnormalities in the composition of different parts of mottled citrus trees may be due, in part at least, to the inability of the tree to satisfy its normal calcium requirements at critical periods. The possibility of correlating abnormalities in the composition of mottled trees with conditions conducive to the disease is suggested. The significance of subnormal concentrations of calcium accompanied by supernormal concentrations of potassium and phosphorus in the leaves, especially in relation to the limiting of chlorophyll production, is not known. No causal relationship may exist. If an inadequate supply of calcium conditions the deficiency of chlorophyll, it probably does so indirectly. Mottle-leaf must be produced experimentally before any explanation can be safely accepted. The leaves of affected trees are not suffering from inadequate supplies of potassium, phosphorus, nitrogen, or iron.—*L. M. Massey.*

1377. LEVINE, MICHAEL. Studies on plant cancers—II—The behavior of crown gall on the rubber plant (*Ficus elastica*). *Mycologia* 13: 1-11. *Pl. 1-2*. 1921.—“*Bacterium tumefaciens* inoculated into the apical internode of the branches, into the leaves, or main stem of the rubber tree stimulates the development of a neoplasm in the region of inoculation. The early stages in the development of the crown gall in *Ficus elastica* does not interfere with the life of the plant as a whole nor does it interfere with the growth of the inoculated branches. The crown gall in *Ficus elastica* after a number of months of active growth becomes hard and dry and finally dies. The invasion of the stem by the new growth does not destroy the entire conducting system of the stem, yet that portion of the stem above the gall dies, as well as a considerable portion of the stem below. Cultures made from pieces of the crown gall and stem above the gall yield only a schizomycete which in appearance is not unlike *B. tumefaciens* and which when inoculated into the stem of young geranium and rubber plants produces crown galls in the region of inoculation. It is possible that the crown gall cells or the crown gall forming organisms are responsible for the progressive necrosis of the stem from the gall upward and downward. The death of the plant due to crown gall is at least suggestive of the death caused by malignant growth in animals.”—*H. R. Rosen.*

1378. LÓPEZ DOMÍNGUEZ, F. A. Has “yellow-stripe” or “mottling” disease any effect on the sugar content of cane juice? *Jour. Dept. Agric. Porto Rico* 34: 47-64. 1919 [1920].—From a series of analyses of healthy cane and cane affected with the mosaic disease it is con-

cluded that there is no material reduction in the sugar content of juice from affected plants. When stalks are so severely affected that they are cracked open, fermentation sets in and sucrose is lost.—The juice of diseased cane shows a higher acidity; this is not sufficient to cause inversion except in very acute stages of the disease.—*D. Reddick*.

1379. MELCHERS, LEO E., AND JOHN N. PARKER. Three winter wheat varieties resistant to leaf rust in Kansas. *Phytopath.* 10: 164–171. 2 fig. 1920.—Experiments carried on for 6 years show 3 hard winter wheats, "P762 Kanred," "P1066," and "P1068" to be markedly resistant to leaf rust, *Puccinia triticina*. These varieties grown in commercial fields over Kansas retain their resistant qualities.—*H. H. McKinney*.

1380. TOWNSEND, C. O. An immune variety of sugar cane. *Sugar* 21: 305. 1919.—The Kavangire cane and its immunity to the mosaic disease are described.—*C. W. Edgerton*.

1381. TOWNSEND, C. O. Una variedad immune de la caña de azucar. [An immune variety of sugar cane.] *Sugar* 21: 392. 1919.—A translation in Spanish of an earlier article [see the preceding entry].—*C. W. Edgerton*.

1382. TUBEUF, C. VON. Die Wirtspflanzen von *Peridermium strobi*. [Host plants of *Peridermium strobi*.] *Naturw. Zeitschr. Forst- u. Landw.* 18: 214–215. 1920.—A list of the hosts on which *Peridermium strobi* has been discovered is given: *Pinus Strobus*, *P. Lambertiana*, *P. monticola*, *P. flexilis*, *P. aristata*, *P. cembra sibirica*, *P. cembra alpina*, and *P. peuce*. No case has been observed of an attack on *Pinus excelsa*.—*J. Roeser*.

### DESCRIPTIVE PLANT PATHOLOGY

1383. B[ARBER], C. H. The mosaic or mottling disease of sugar cane. *Internat. Sugar Jour.* 23: 12–19. 1 pl. 1921.—A summary of the work on sugar cane mosaic by J. R. JOHNSTON, R. M. GREY, C. W. EDGERTON, F. S. EARLE, G. L. FAWCETT, J. A. STEVENSON, and E. W. BRANDES.—*E. Koch Tisdale*.

1384. CARPENTER, C. W. Hawaii Agricultural Station reports on cane root rot fungus. *Sugar* 22: 20–22. 1920.—The deterioration of Lahaina cane, and its relation to a fungus of the *Pythium* type, are discussed.—*C. W. Edgerton*.

1385. COLON, E. D. La enfermedad de las rayas amarillas. [The yellow stripe disease.] *Sugar* 21: 52. 1919.—A short discussion of the yellow stripe or mosaic disease of sugar cane.—*C. W. Edgerton*.

1386. CUTTING, E. M. [Rev. of: HILEY, W. E. The fungal diseases of the common larch\* xi + 204 p., 73 pl. and diagrams. Clarendon Press: Oxford, 1919 (see Bot. Absts. 7, Entry 1188).] *Sci. Prog.* [London] 15: 146–147. 1920.

1387. EARLE, F. S. La enfermedad del mosaico en Puerto Rico. [The mosaic disease in Porto Rico.] *Sugar* 21: 551. 1919.—A brief discussion of the mosaic disease of sugar cane in Porto Rico is presented.—*C. W. Edgerton*.

1388. EDGERTON, C. W., AND C. C. MORELAND. Tomato wilt. *Louisiana Agric. Exp. Sta. Bull.* 174. 54 p., 19 fig. 1920.—Results are presented of 10 years investigations on the tomato wilt, including laboratory, greenhouse, and field work. The disease shows on all parts of the host plant and during all stages of its development. It is, however, most frequently observed about the time the fruits are developing. The fungus, *Fusarium lycopersici*, enters the plants from the soil. The spores of the fungus will remain alive on tomato seed from fall to spring. The disease develops best on light, fertile soil; it is very rarely found in the alluvial sections of the state. Some substances added to the soil retard the development of the disease. Ten tons of lime to the acre delays the wilt for about 2 weeks or more. The disease develops best when the temperature is comparatively high, the optimum tem-



perature for growth of the fungus being around 29°C. When the temperature remains much below this, the disease does not develop strongly. This is shown by weekly tests made throughout the year. During the winter months, the infection percentage was very low.—Attempts to obtain wilt-resistant strains have given good results. No variety is immune, but the wilt develops much more slowly in some than in others; this slower development enables the more resistant strains to make a satisfactory crop of fruit. Many of the commercial varieties, including the widely grown Stone variety, are extremely susceptible to the disease. Results of variety tests are given. The recommendations for control include rotation, seed bed sanitation, and the use of resistant and early varieties.—*C. W. Edgerton.*

1389. ELLIOTT, JOHN A. Arkansas cotton diseases. Arkansas Agric. Exp. Sta. Bull. 173. 26 p., 5 pl. 1921.—This is a popular account of Arkansas cotton diseases, with notes on occurrence. "Phoma blight" is described as a new disease.—*John A. Elliott.*

1390. GESCHWIND, ANDREAS. Das Vorkommen des Hallimasch (*Agaricus melleus* Quèl.) in den Bosnisch-herzegowinischen Wäldern. [The occurrence of a honey mushroom in the forests of Bosnia-Herzegowina.] Naturw. Zeitschr. Forst- u. Landw. 18: 182-186. 1920.—*Armillaria mellea* is as common in the more or less natural forests of this province as it is in those of central Europe, but it is less destructive than in the cultural forests of the latter. Under natural conditions, beech and aspen, when in mixture with softwoods, protect the latter by acting as hosts for the disease. Wherever the beech is removed from the forest to make room for softwood reproduction, the result is that the desired reproduction does not come and the softwood falls prey to the fungus. The common practice of opening the forest, when a part of a meadow unit, to induce the growth of grasses, furnishes ideal conditions for the entrance of bark-beetles and the honey mushroom. In the extensive forests of the plains ("Karstwälder"), the physical conditions of the soil furnish less ideal conditions for the spread of the rhizomorphs through the soil than do the other forests.—*J. Roeser.*

1391. GODFREY, G. H. A seed-borne *Sclerotium* and its relation to a rice-seedling disease. Phytopath. 10: 342. 1920.—The author notes the occurrence of a seed-borne *Sclerotium* of rice in Louisiana and its relation to a seedling blight. The possibility of hot water seed-treatment is suggested.—*W. H. Tisdale.*

1392. HAHN, G. G. *Phomopsis juniperovora*, a new species causing blight of nursery cedars. Phytopath. 10: 249-253. 1 pl. 1920.—Study of a fungus causing a widespread nursery blight of *Juniperus virginiana* from New York to Kansas indicates that a new species is involved. The fungus is similar to *Phomopsis thujae*, a European form. Greenhouse inoculations on *Thuja* gave positive results, but negative ones were obtained on *Abies*, *Picea*, and *Pinus*.—*P. V. Siggers.*

1393. HAMBLIN, CHAS. O. Flag smut and its control. Agric. Gaz. New South Wales 32: 23. 1921.—Notes are given on the disease and hints as to its control.—*L. R. Waldron.*

1394. HARTER, L. L., AND J. L. WEIMER. Sweet potato stem rot and tomato wilt. Phytopath. 10: 306-307. 1920.—The authors report negative results from inoculating sweet potatoes and tomatoes, using respectively *Fusarium lycopersici* from tomatoes and *Fusarium hyperoxysporum* from sweet potato.—*William B. Tisdale.*

1395. HARTLEY, CARL, AND GLENN G. HAHN. Notes on some diseases of aspen. Phytopath. 10: 140-147. 3 fig. 1920.—The authors describe certain diseases found on the aspen in the Pike's Peak region of Colorado. Much damage to leaves is often caused by *Sclerotinia bifrons*, very little damage by *Melampsora albertensis* but a premature defoliation by *M. medusae*, and a blighting of leaves and lateral twigs by *Marsonia populi*. Twig troubles and cankers on trunk and stem are described but no causal organism has been found. *Fomes igniarius* causes rot and premature death of the aspen.—*E. M. Gilbert.*

1396. HOWARD, W. L., AND W. T. HORNE. Brown rot of apricots. Univ. California Agric. Exp. Sta. Bull. 326. 73-88. 1920.—The results for one season, using 16 different spray treatments, justify the conclusion that apricot blossoms may be effectively protected from brown rot by spraying the trees once, shortly before they come into bloom, with either lime-sulphur or Bordeaux mixture. The lime-sulphur should be used at the rate of 1 gallon to 9 gallons of water, and the Bordeaux mixture at a strength of 4-5-50 (4 lbs. bluestone, 5 lbs. fresh stone lime, 50 gal. water). The so-called dry lime-sulphur, used at the rate of 12 lbs. to 50 gal. of water, is quite as effective as either of the other 2 sprays. Early winter spraying against the brown rot is useless. Brown rot on the fruit cannot be prevented by cutting out the diseased twigs, but twig blight can be controlled as effectively, and more easily, by removing them in the fall or winter as by cutting them out in the spring.—A. R. C. Haas.

1397. HUBERT, E. E. Observations on *Cytospora chrysosperma* in the Northwest. Phytopath. 10: 442-447. 1920.—The unusually dry summers of 1917, 1918, and 1919 favored the development of *Cytospora chrysosperma* on shade and ornamental trees. It is common and injurious in Montana, Idaho, Wyoming, and Washington on species of *Populus*, *Acer* and *Salix*, *Prunus demissa*, *Sorbus scopulina*, and *Sambucus glauca*. The author produced infection on small plants of *Populus trichocarpa* low in vigor. Control methods consist in selecting resistant species, giving proper care to shade trees, and closely inspecting nursery stock.—C. J. Humphrey.

1398. JOHNSON, JAMES. Fusarium-wilt of tobacco. Jour. Agric. Res. 20: 515-535. Pl. 63-67. 1921.—This previously undescribed disease was found to occur in Maryland, Ohio, and Kentucky. It is characterized by a yellowing and wilting of the leaves, usually followed by death of the entire plant. The vascular system of infected plants is characteristically brown or black. The pathogene concerned is *Fusarium oxysporum* (Schlecht.) Wr. var. *nicotianae* n. var., of which a description is given. The fungus differs somewhat from *F. oxysporum* (Schlecht.) Wr. in morphology, physiology, and pathogenicity. Infection was secured with 2 strains of *F. oxysporum* from potato on tobacco, but not with the tobacco strain on potato. The symptoms of the wilt produced by the potato strain were not identical with those produced by the strain from tobacco. Conditions favoring infection with the tobacco-wilt organism are heavy soil infestation, wounded host tissue, a relatively high soil temperature (28-31°C.), and a susceptible variety. Varieties of tobacco differ markedly in their resistance to the disease. The White-Burley variety is most susceptible, and the Havana Seed and Cuban varieties are among the most resistant. The development of resistant strains within the various susceptible varieties offers the most helpful means of control. Growers are advised not to grow tobacco on infested soils and to avoid the danger of infested seed beds.—L. M. Massey.

1399. MATZ, JULIUS. Gummy disease of sugar cane in Porto Rico. Phytopath. 10: 429-430. 1 fig. 1920.—The author gives the distribution of the gummy disease caused by *Bacterium vascularum*. The variety "Otaheite" is very susceptible to the disease. "Caven-gerie," a less popular variety, is apparently very resistant.—William B. Tisdale.

1400. MATZ, JULIUS. Gummy disease of sugar cane in Porto Rico. Sugar 22: 282-283. 1920.—A description and history of the gummy disease of sugar cane caused by *Bacterium vascularum*.—C. W. Edgerton.

1401. MATZ, JULIUS. La gomosis de la caña de azucar. [Gummy disease of sugar cane.] Sugar 22: 363-364. 1 fig. 1920.—A translation in Spanish of an earlier publication [see preceding entry].—C. W. Edgerton.

1402. MERKER, GUSTAV. Ein neuer Pilzschädling im Fichtenpflanzgarten. [A new fungus pest in Norway spruce (*Picea excelsa*) nurseries.] Naturw. Zeitschr. Forst- u. Landw. 18: 218-219. 1920.—This new disease was discovered on 4-year spruce in the spring of 1920 in the "Forstverwaltung" Grätz, near Troppau in Silesia, and the causal organism was identi-



fied as *Rhizoctonia violacea*. It is commonly known to attack the roots of various garden plants, such as clover, lucern, beets, etc., and has been known to attack young larch trees. This is the first known attack on spruce. It manifests itself as a dense violet fungus covering on the roots and root collar, which in part peels off as layers, in part adheres firmly. Attacked plants should be immediately removed and the soil strewn over with quicklime and turned under.—*J. Roesser*.

1403. QUANJER, H. M. The mosaic disease of the Solanaceae, its relations to the phloem-necrosis and its effect upon potato culture. *Phytopath.* 10: 35-37. 14 fig. 1920.—Field and greenhouse experiments conducted for a number of years show the mosaic on tobacco, tomato, and potato to be of a similar nature. The mosaic symptoms on the potato become evident the season after infection. Grafting experiments demonstrate the contagious nature of the disease. The experiments indicate that transmission under field conditions is usually through root contact. The author suggests that the disease may be due to a virus but more probably to an ultramicroscopic parasite.—*R. E. Vaughan*.

1404. ROBERTS, JOHN W. The apple-blotch and bitter-rot cankers. *Phytopath.* 10: 353. 1920.—The apple-blotch canker caused by *Phyllosticta solitaria* and the bitter-rot canker caused by *Glomerella cingulata* are discussed from the standpoint of their relation to the host.—*A. J. Riker*.

1405. ROSENBAUM, J. A *Macrosporium* foot-rot of tomato. *Phytopath.* 10: 415-422. 4 fig. 1920.—The fungus, found in Delaware fields and causing a rot at the base of tomato stems, resembles the parasite (*M. solani*) causing the early blight of potato. The pathogenicity of the organism was established. The fungus differs in cultural and morphological characters from the *Macrosporium* causing the nail-head spots on ripe tomato fruit.—*R. E. Vaughan*.

1406. SEDLACZEK. [Rev. of: NEGER, F. W. Die Krankheiten unserer Waldbäume und wichtigsten Gartengeholze. (Diseases of our forest trees and most important ornamentals.) viii + 286 p., 234 fig. Ferdinand Enke: Stuttgart, 1919 (see Bot. Absts. 6, Entry 1280).] Oesterreich. Forts- u. Jagdzeitg. 38: 37-38. 1920.—This book is similar in compass and arrangement to HARTIG's "Diseases of Trees," but brought up to date. It consists of 2 parts—non-parasitic diseases and diseases caused by parasitic plants.—*F. S. Baker*.

1407. SMILEY, EDWINA M. The *Phyllosticta* blight of snapdragon. *Phytopath.* 10: 232-243. 8 fig. 1920.—*Antirrhinum majus* is the only host known to be affected by *Phyllosticta antirrhini*. Symptoms, etiology, and pathological effects of the disease are discussed.—*Ruth G. Bitterman*.

1408. TUBEUF, C. VON. *Rhizoctonia violacea* an Fichten. [*Rhizoctonia violacea* on Norway spruce (*Picea excelsa*).] *Naturw. Zeitschr. Forst- u. Landw.* 18: 233-234. 1920.—Tubeuf refers to an article by MERKER (see Bot. Absts. 8, Entry 1402), and calls attention to the fact that HARTIG reported this fungus as attacking young spruce. Past experiments to produce the perithecium of the fungus were failures, and the experiments, in general, were superficial. Tests by the author of imported, infected plants in 1919 and 1920 planted with healthy stock, resulted in a full recovery of the diseased stock and no attack on the other.—*J. Roesser*.

1409. WOLF, F. A. Bacterial blight of the soybean. *Phytopath.* 10: 119. 5 fig. 1920.—The author describes a disease of soybeans occurring in North Carolina caused by *Bacterium soyae* n. sp. Symptoms of the disease and cultural character of the causal organism differ from those described by F. COERPER. No difference in varietal susceptibility was noted. The organism is believed to be seed borne.—*William B. Tisdale*.

1410. WOLF, F. A. A little known vetch disease. *Jour. Elisha Mitchell Sci. Soc.* 36: 72-85. Pl. 2-6. 1920.—A report on an important disease caused by *Protocoronospora nigri-*

cans and resembling an anthracnose in its effect. Dark, elongated lesions may occur on any part of the plant above ground. The disease is now known to occur in North Carolina, South Carolina, Georgia, Mississippi, Louisiana, Tennessee, and at Ithaca, New York (the type locality). Infection is carried in the seed, which may thus introduce the disease to new fields.—*W. C. Coker.*

### ERADICATION AND CONTROL MEASURES

1411. ANONYMOUS. Porto Rico fights cane mottling disease. *Sugar* 22: 208-210. 1920.—A review of recent publications from the Porto Rico Experiment Station on the mosaic disease of sugar cane.—*C. W. Edgerton.*

1412. BOTJES, J. OORTWYN. Raising phloem-necrosis and mosaic free potatoes, and a source of infection whose nature has not yet been elucidated. *Phytopath.* 10: 48-49. 1920.—Tubers from selected healthy plants should be planted by the hill-row method with 3 or 4 meters between the rows. The intervening spaces should be planted with other crops. When any plant shows disease all of the same progeny should be discarded. Fields and nursery plots should be widely separated.—*R. E. Vaughan.*

1413. BUTLER, O. On the amount of copper required for the control of *Phytophthora infestans* on potatoes. *Phytopath.* 10: 298-304. 3 fig. 1920.—Spraying experiments with Bordeaux near Durham, New Hampshire, in 1919, showed the amount of copper necessary per acre per annum to control losses from *P. infestans* to be between 24 and 26 lbs. The experiments demonstrated that 1:0.5 Bordeaux was superior to 1:1.—*R. E. Vaughan.*

1414. DETWILER, S. B. Results of white pine blister-rust control in 1919. *Phytopath.* 10: 177-180. 1920.—A summary of the blister-rust control work done in the U. S. A., with detailed statement of cost of Ribes eradication.—*Frank T. McFarland.*

1415. EARLE, F. S. Instrucciones para la eradicacion de la enfermedad del Mosaico de la cana. [Instructions for the eradication of the mosaic disease of cane.] *Sugar* 21: 51-52. 1919.—A brief discussion of the mosaic disease of sugar cane and its control by means of selection and rogueing.—*C. W. Edgerton.*

1416. EDGERTON, C. W. A new method of selecting L 511 cane free of the mosaic disease for planting purposes. *Louisiana Planter and Sugar Manufacturer* 65: 252-253. 1920.—Practically a reprint of *Louisiana Agric. Exp. Sta. Bull.* 176 [see following entry].—*C. W. Edgerton.*

1417. EDGERTON, C. W. A method of selecting L 511 cane free of the mosaic disease for planting purposes. *Louisiana Agric. Exp. Sta. Bull.* 176. 7p., 1fig. 1920.—The L 511 variety of sugar cane is more resistant to the mosaic disease than the other common varieties. The disease can be detected upon the stalks of this variety by the presence of red stripes. In selecting healthy cane for seed, the stalks can be selected after being cut and stripped, thus eliminating the difficult field inspection. A 1-year test of this method of selection proved entirely satisfactory.—*C. W. Edgerton.*

1418. GILBERT, ALFRED H. Certified seed inspection in Vermont. *Potato Mag.* 3: 6, 20-21, 26. 1921.

1419. GOUAUX, C. B. Mosaic disease of sugar cane in Louisiana. *Louisiana Planter and Sugar Manufacturer* 65: 269. 1920.—Recommendations for rogueing out diseased plants in sections where the disease is as yet very limited.—*C. W. Edgerton.*

1420. HENNING, ERNST, OCH THORE LINDFORS. Krusbärsmjöldaggens Bekämpande—Studier och Forsök. [Gooseberry mildew control—investigations and experiments.] *Centralanst. Försöksv. Jordbruksområdet Medd.* 208. 51 p. 1920.—The article describes briefly



the first appearance of mildew in Ireland and its subsequent spread into Sweden and other European countries. Digging and burning were the first methods of control advocated. Henning in 1907 reported good results from pruning and spraying. Results with other control methods are discussed. The production of good resistant varieties by means of crosses between European and American varieties is considered possible. The results of spraying experiments with 17 different spray materials are given. The mildew is said to be most severe on bushes grown in moist locations or fertilized with nitrogenous materials. A brief discussion of the quarantine laws in several European countries is given. Control methods advocated include the cutting out and burning of diseased portions in the fall, together with liming and cultivating the bushes. The eradication of nearby wild bushes is advised. In the spring, the tops of plants to be set out should be dipped in 1-40 formalin solution, and plants should be sprayed with a formalin solution. If buds have not started, a 1-40 or 1-60 solution is recommended; but if plants have begun to bud, a 1-100 solution should be used.—*Mr. and Mrs. W. W. Gilbert.*

1421. HOLBERT, J. R., J. F. FROST, AND G. N. HOFFER. Wheat scabs as affected by systems of rotation. *Phytopath.* 9: 45-47. 1919.—A report of a survey of 1500 acres of wheat in 28 fields in central Illinois. Wheat following corn showed considerably more scab (*Gibberella saubinetii* (?) than when following wheat, oats, or clover in the rotation. In 1 field, wheat following 2 years of corn yielded 25 bushels with 20 per cent scab; wheat following 1 year of corn yielded 33 bushels with 2 per cent scab. The most severe scab infestations were found in low places where trash from the preceding crop had collected.—*C. W. Bennett.*

1422. MURPHY, PAUL A., AND E. J. WORTHY. Relation of climate to the development and control of leaf roll of potato. *Phytopath.* 10: 407-414. 1 fig. 1920.—Hill selections of leaf-roll plants from Prince Edward Island in 1916 were planted in 1917 in tuber units at Charlestown, Prince Edward Island; Bermuda; and Ottawa, Canada. Plants from the same hills reacted similarly at each station. The next year the Bermuda seed at Charlestown showed 97.5 per cent leaf-roll compared with 60.7 per cent in local stock. Authors suggest wholesale introduction of potato seed from disease-free districts as a practical means of control.—*R. E. Vaughan.*

1423. PEYRONEL, B. Sevrnamento di *Marsonia juglandis* sui rami e polloni del noce. [The overwintering of *Marsonia juglandis* on the branches and shoots of the walnut. *Staz. Sperim. Agrarie Ital.* 53: 168-171. 1920.—The author found in the winter months, on the young branches and twigs of *Juglans*, the conidial form of *Marsonia juglandis*, and suggests a close examination of the branches of infected plants, since these are exceedingly good sources of infection in early spring.—*A. Bonazzi.*

1424. STEVENSON, JOHN A. Control of sugar cane mottling disease. *Sugar* 22: 539-541. Fig. 1. 1920.—An article reprinted from *Jour. Dept. Agric. Porto Rico*. Methods being used in Porto Rico to control the mosaic disease of sugar cane are discussed.—*C. W. Edgerton.*

1425. TICE, C. Seed-potato inspection. *Agric. Jour.* [British Columbia] 5: 276. 1920.

1426. TICE, C. Potato certification in B. C. *British Columbia Dept. Agric. Circ. Bull.* 32. 6 p. 1921.

1427. WALKER, J. C. Experiments upon formaldehyde-drip control of onion smut. *Phytopath.* 10: 323-327. 1920.—Experiments conducted near Racine, Wisconsin, from 1913 to 1918 show that the application of approximately 200 gallons of 1:128 formaldehyde solution per acre gives satisfactory control of onion smut. When the quantity of solution is reduced to 120-150 gallons the writer advises increasing the concentration to 1:64.—*R. E. Vaughan.*

## MISCELLANEOUS (COGNATE RESEARCHES; TECHNIQUE, ETC.)

1428. FISHER, D. F., AND C. BROOKS. Drouth-spot and related physiological diseases. *Agric. Jour. [British Columbia]* 5: 290-293. 6 fig. 1920.—A paper read at the International Fruit Growers' Convention, Vernon, B. C., August 1920. With typical drouth-spot Winesap and Stayman were observed to be most seriously affected, followed by Gano and Ben Davis Delicious, White Pearmain, and Jonathan do not react in the same way. Although the fruit may become badly shriveled no drouth-spot appears, and with the resumption of irrigation the apples regain normal turgor and mature with merely a certain deficiency in size and "quality." Typical drouth-spot and oozing developed on susceptible varieties before shriveling and the resumption of irrigation. It must, therefore, be due to withdrawal of water and not to sudden resumption of growth on addition of water. "Cork" is always associated with very open or very shallow soils or those markedly deficient in humus. "Apple blister" is probably due to drouth during or immediately following the blossoming period, the remedy being earlier irrigation. "Punk" is a condition somewhat resembling "physiological break-down" in storage and possibly due to intermittent drouth combined with intense sunlight. A drouth-spot accompanied by copious gumming, and resulting in hard bitter spots in the ripe fruit, also occurs in plums and prunes.—J. W. Eastham.
1429. HARTLEY, CARL. Abnormal growth induced by chloral hydrate soil treatment. *Phytopath.* 10: 334-335. 1 fig. 1920.—Chloral hydrate (0.076 and 0.172 kgm. per sq. m.) applied to the soil before sowing to *Pinus ponderosa* seed produced seedlings with the first needles partially fastened together, as well as showing other abnormalities.—James Johnson.
1430. LEVIN, ISAAC, AND MICHAEL LEVINE. The biological and clinical evidence of the therapeutic value of radium and Röntgen rays in cancer. *Ann. Surgery* 52: 443-447. Apr., 1918.—In a preliminary study of the effect of Röntgen rays on normal *Ricinus* plants it was found that no injury resulted. *Ricinus* plants inoculated with *Bacterium tumefaciens* and given 6 treatments with Röntgen rays at intervals of 2 days for a period of 2 weeks showed no evidence of infection after 4 weeks, or developed only a minute swelling at the point of inoculation. These minute swellings consisted of typical tumor cells of arrested development. Control plants inoculated from the same sub-culture developed large galls in 4 weeks. The results of these experiments are cited as proof that the effect of Röntgen rays on malignant tumors is an inhibition of the proliferating power of the tumor cells and not their destruction. The therapeutic value of the X-ray treatment before and after operation for cancer is pointed out.—R. Nelson.
1431. LEVINE, MAX. Notes on *Bact. coli* and *Bact. aerogenes*. *Amer. Jour. Public Health* 11: 21-23. 1921.—It is reported that in making counts of *Bacterium aerogenes* the growth of *B. coli* can be repressed by suitable concentration of crystal violet or brilliant green, and that lowering the concentration of peptone in the medium increases the toxicity of the dyes.—C. A. Ludwig.
1432. MACMILLAN, H. G. A frost injury of potatoes. *Phytopath.* 10: 423-424. 1 pl. 1920.—Small necrotic areas less than 1 millimeter in diameter are produced on leaves of potato plants. By experimental data the trouble is shown to be due to frost.—H. H. McKinney.
1433. MACMILLAN, H. G., AND L. P. BYARS. Heat injury to beans in Colorado. *Phytopath.* 10: 365-367. 1 fig. 1920.—The authors report a shrunk and collapsed condition of the stem of bean seedlings which occurred at the ground line. The root systems were found healthy and well developed. No organism was found associated with the affected parts. Meteorological records indicated an air temperature range from 28° F. on June 3 to 104° F. on June 29. The soil temperature 1 inch below the surface registered 113° F. on the latter date. The authors consider the condition described to have arisen from high temperature.—W. B. Tisdale.

1434. NORTON, J. B. S., AND C. C. CHEN. Some methods for investigating internal seed infection. *Phytopath.* 10: 399-400. 1920.—The authors outline a method of seed disinfection consisting in pre-soaking, treating in an alcoholic solution of corrosive sublimate followed by a thorough washing in ethyl alcohol and finally in sterile water.—*H. H. McKinney.*

1435. WEIR, J. R. Note on the pathological effect of blazing trees. *Phytopath.* 10: 371-373. 1920.—The writer records the prevalence of sporophores of various heart-rotting fungi on blazes on resinous and non-resinous species of conifers in Montana and Idaho. Eighty-six per cent more sporophores were found on the resinous group than on the non-resinous group.—*C. J. Humphrey.*

## PHARMACOGNOSY AND PHARMACEUTICAL BOTANY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 1020, 1295, 1308)

1436. BEYTHIEN, A., UND H. HEMPEL. Ueber Rangoonbohnen. [Rangoon beans.] *Pharm. Zentralhalle* 61: 295-296. 1920.—Samples (226) of Rangoon beans were examined of which 90 per cent contained less than 0.015 per cent of hydrocyanic acid. Of these, 73 per cent contained between 0.006 and 0.015 per cent of the acid. No sample contained more than 20 mg. per 100 gm.—*H. Engelhardt.*

1437. BEYTHIEN, A., UND H. HEMPEL. Ueber das Vorkommen von Rangoonbohnen im Kleinhandel. [The occurrence of the Rangoon bean in retail trade.] *Pharm. Zentralhalle* 61: 27-29. 1920.—Although the German government has prohibited the importation of the bean on account of some cases of poisoning which had been reported, small quantities of the bean had found their way into Germany. The authors report on analyses carried out with several samples and find that the percentage of hydrocyanic acid in the bean is not by far as great as is generally reported. They found from 0.00075 to 0.0054 per cent in these products. Furthermore, they state, most of the acid is lost in boiling the bean.—*H. Engelhardt.*

1438. BRAUN, HANS. Ueber Quellstifte aus Laminariastielen und Tupeloholz. [Dilating tents made of Laminaria stems and Tupelo wood.] *Pharm. Zentralhalle* 61: 586-591. *Fig. 4.* 1920.—An account of the history of dilating bougies made of the stems of *Laminaria* and Tupelo wood and a microscopical and biologic description of the material are given. It is stated that the stems of *Laminaria hyperborea* Foslie are more suitable for making tents than those of *L. Cloustonia* and *L. stenophylla*. Tents made of Tupelo wood, especially when they are varnished as is usually the case, are of little value, because they possess only a very slight swelling power. Requirements for Laminaria bougies and distinctive characteristics of Tupelo wood bougies are given.—*H. Engelhardt.*

1439. GRIFFITHS, E. L. Cocoa husks as a fodder. *Agric. Gaz. New South Wales* 32: 55-56. 1921.—Review of literature shows that cocoa husks contain alkaloids, theobromin and caffein, which produce lethal effects when husks are fed in normal forage quantity. Husks must be fed sparingly, if at all.—*L. R. Waldron.*

1440. GRIMME, CLEMENS. Ist die Rangoonbohne wirklich giftig oder doch wenigstens als schädlich für den menschlichen Genuss anzusprechen? [Is the Rangoon bean really poisonous or must it at least be considered as a food detrimental to man?] *Pharm. Zentralhalle* 61: 159-166. 1920.—The results of analyses of numerous samples of the bean have shown that the hydrocyanic acid in it averages less than 0.02 per cent, that the acid is lost in boiling the beans with water and that the bean is, therefore, harmless. A few samples showed a rather high percentage of hydrocyanic acid, but these were derived from wild-growing plants. From cultivated plants, beans with considerably less acid are obtained.—*H. Engelhardt.*



1441. GRIMME, CLEMENS. Ueber den Alkaloidgehalt von Herbstzeitlosensamen und ueber das Herbstzeitlosensamen Öl. [The alkaloidal content of *Colchicum* seed and the fixed oil in *Colchicum* seed.] Pharm. Zentralhalle 61: 521-524. 1920.—By extracting the seed with ether 17.6 per cent of a light-brown odorless semi-drying oil was obtained which had a pungent taste. The following constants were found: Sp. gr., 0.9176; congealing point, 9°C.; refractive index, 1.4642; acid number, 20.3 (free oleic acid 10.2 per cent); saponification number 184; iodine number, 128.5; and unsaponifiable substances, 0.71 per cent. The fatty acids obtained from the oil were pale yellow in color, melted at 24°C., congealed at 22.5°C., had a refractive index of 1.4646, a saponification number of 187.6, an iodine value of 131, and an average molecular weight of 300.3. It was also found that the percentage of colchicine in the seeds is in inverse proportion to the weight of the seeds.—H. Engelhardt.

1442. KARLSSON, KARL ALGOT. *Matricaria discoidea* DC. Svensk Farm. Tidskr. 24: 517-521, 533-538. 1920.—*Matricaria discoidea* DC. (*Matricaria suaveolens* Buch., *Chrysanthemum suaveolens* Asch., *Chamomilla discoidea* J. Gay) is recommended as a substitute for the less easily obtainable camomile (chamomile), *Anthemis nobilis*. The paper includes an historical review, the comparative chemical properties, and a macroscopic and microscopic study of the 2 plants.—A. M. Hjort.

1443. MARSH, C. DWIGHT, AND A. B. CLAWSON. *Daubentonia longifolia* (Coffee bean), a poisonous plant. Jour. Agric. Res. 20: 507-513. 1920 [1921].—The seeds of *D. longifolia* (*Sesbania cavanillesii*) of the Leguminosae are very poisonous to sheep. The smallest dose of seed producing death was 0.11 pound per hundredweight of animal. The toxic principle is not named.—D. Reddick.

1444. ROSENTHALER, L. Ueber die Beziehungen zwischen dem Gewicht von Drogen und ihrem Gehalt an giftigen Stoffen. [The relation between the weight of drugs and their content of poisonous principles.] Pharm. Zentralhalle 61: 629-630. 1920.—In an article concerning the relation between the weight of *Colchicum* seeds and the amount of colchicine which they contain GRIMME states that no literature is available on the subject. Rosenthaler, however, claims that the fact that specifically lighter drugs contain a higher percentage of active principles than specifically heavier drugs, has been known for a long time and that the Swiss pharmacopoeia for this reason excludes ergot of more than 25 mm. length. He further states that in many other drugs the amount of active principles is in inverse proportion to the weight, as for instance in bitter almonds, areca nuts, calabar beans, aconite root, belladonna root, etc. [See also Bot. Absts. 8, Entry 1441.]—H. Engelhardt.

1445. VESTLIN, CONRAD. *Pimpinella-Saponin*. Pharm. Zentralhalle 61: 77-78. 1920.—*Pimpinella saxifraga* contains about 2.5 per cent of crude saponin and about 1 per cent of pure saponin, which possesses the formula  $C_{23}H_{36}O_{18} + 2H_2O$  and, therefore, belongs to the class of saponins of the general formula  $C_nH_{2n-10}O_{18} + 2H_2O$ . In no other plants of the Umbelliferae have saponins been found.—H. Engelhardt.

1446. VIEHOEVER, ARNO, JOSEPH F. CLEVINGER, AND CLARE OLIN EWING. Studies in mustard seeds and substitutes: I Chinese colza (*Brassica campestris chinoleifera* Viehovever). Jour. Agric. Res. 20: 117-139. Pl. 10-19. 1920.—Seed imported extensively in U. S. A. as rape seed but offered for sale as mustard seed is really *Brassica campestris chinoleifera* n. var. Means of identification of seeds by microscopic examination are described in detail. Plants have been grown from seed and the characteristics established. The variety is closely related to the colza group (*Brassica campestris*).—The volatile oil obtained from the seed is crotonyl isothiocyanate. It is not a suitable substitute for mustard oil, in respect to either condimental, bactericidal, or medicinal values.—The fixed oil is of the general composition of the rape oils, and amounts to more than 40 per cent. The seed should prove useful as pressed oil cake, the leaves as greens, and the plants as forage.—Full descriptions and illustrations are presented and taxonomic problems discussed. A bibliography of 52 titles is appended.—D. Reddick.

1447. WESTER, D. H. Ueber den merkwürdigen Verlauf der Ureasewirkung eines Sojabohnenextraktes beim Erwärmen auf 37°. [The peculiar action of the urease in soybean extract when heated at 37°C.] Pharm. Zentralhalle 61: 293-295. 1920.—The author found that the action of urease on soybean extract changes considerably when kept at 37°; thus he found that while the urea number (i.e., the number of mg. of urea converted by the urease solution) was 126 on the first day, after 7 days' standing it had been reduced to 47 and after 14 days to 38.2, and had increased after 21 days to 90, declining after 26 days to 85, and after 35 days to 60.3.—*H. Engelhardt.*

## PHYSIOLOGY

B. M. DUGGAR, *Editor*

CARROLL W. DODGE, *Assistant Editor*

(See also in this issue Entries 769, 770, 778, 779, 785, 791, 805, 812, 942, 944, 948, 1069, 1116, 1118, 1147, 1163, 1211, 1229, 1357, 1369, 1374, 1375, 1376, 1429, 1430, 1431, 1445, 1447, 1509, 1514, 1518, 1526, 1529, 1533, 1535, 1574.)

## GENERAL

1448. CLARK, W. M. The determination of hydrogen ions. 317 p., 38 fig. Williams & Wilkins Co.: Baltimore, 1920.—In his preface the author points out interesting biological and chemical investigations as landmarks in the comprehension and measurement of "acidity," and while recognizing that the hydrogen ion may be a center of great interest because it is a dissociation product of so many compounds with which the biochemist deals, he also indicates that it is a factor which should not be permitted to "obscure possibilities of broader generalizations."—The book is written in response to the need of a detailed exposition of the two methods—colorimetric and electrometric—in daily use to determine hydrogen-ion concentration. Accordingly, Chapter I is concerned with some of the general relations among acids and bases, including a discussion of the  $P_H$  scale and buffer action. This is followed by captions (pp. 38-96) in which are presented discussions of the colorimetric procedure, theory of indicators, choice of indicators, buffer solutions, protein and salt errors, and the value and limitations of approximate determinations with indicators. Chapters VIII-XVII deal with the electrometric method, including the theoretical aspects as well as detailed descriptions of the hydrogen and calomel electrodes and electrode vessels, and the potentiometer and equipment, also errors of measurement, and standardization methods. A brief chapter relating to supplementary methods is followed by a more elaborate presentation of "applications" intended primarily for the biochemist and biologist, but considered by the author as merely a "cursory review" and as an index to the bibliography. The bibliography extends over 64 pages and includes some titles as late as 1919 and 1920. There are 9 pages of tables.—*B. M. Duggar.*

1449. THATCHER, R. W. The chemistry of plant life. xvi + 268 p. McGraw-Hill Book Co.: New York, 1921.—This book is intended to serve primarily as a handbook dealing with the constitution of the compounds involved in plant growth, likewise the conditions under which such compounds undergo chemical changes in the protoplasm. After a brief chapter on "plant nutrients," encompassing the mineral nutrients and their roles, the author sets forth in a few pages (chapter 2) on the organic components of plants the significance of the materials to be treated, and classifies the important groups of compounds as follows: The carbohydrates and their derivatives, the glucosides and tannins; the fats and waxes; the essential oils and resins; organic acids and their salts; the proteins; the vegetable bases and alkaloids; and the pigments. Ten of the remaining 16 chapters (150 pages) are devoted to the description and discussion of these groups of substances. These sections are preceded by a chapter on photosynthesis, in which there is elaborated the trend of investigations following BAEYER's suggestion, now frequently known as Baeyer's formaldehyde hypothesis. The remaining 5 chapters deal with enzymes, the colloidal condition, the physical chemistry of protoplasm, accessory stimulating agencies, and adaptations.—*B. M. Duggar.*

## PROTOPLASM, MOTILITY

1450. ANONYMOUS. The components and colloidal behavior of protoplasm. *Sci. Amer. Monthly* 2: 271-272. 1920. [From *Science* 51: 595-596. 1920.]

## DIFFUSION, PERMEABILITY

1451. KNIGHT, R. C. Plant physiology. *Sci. Prog.* [London] 15: 200-206. 1920.—This is a brief review of some important papers dealing with storage and translocation of the food products in plants.—J. L. Weimer.

1452. MANN, H. An apparatus for continuous dialysis or extraction. *Jour. Biol. Chem.* 44: 207-209. 1920.

1453. MUKERJI, J. N. The excretion of toxins from the roots of plants. *Agric. Jour. India* 15: 502-507. 1920.—The conclusions of FLETCHER (*Mem. Dept. Agric. India, Bot. Ser.* 2<sup>o</sup>: 1-16. 1908) that plants secrete toxic substances are held to be due to the use in his experiments of too concentrated a solution. Data of experiments with Knop's nutrient solution having a total salt concentration of 0.11 per cent are presented, where wheat, *cajanus*, and grain were grown. The solution which had previously grown a set of plants supported better growth than did the fresh solution.—J. J. Skinner.

1454. SHULL, C. A. Absorption limits. [Rev. of: HARVEY, R. B., AND R. H. TRUE. Root absorption from solutions at minimum concentrations. *Amer. Jour. Bot.* 5: 516-521. 1918 (see *Bot. Absts.* 2, Entry 547).] *Bot. Gaz.* 68: 486. 1919.

## WATER RELATIONS

1455. LANGDON, LADEMA M. Wood structure and conductivity. [Rev. of: (1) FARMER, J. B. On the quantitative differences in the water-conductivity of the wood in trees and shrubs. *Proc. Roy. Soc. London B* 90: 218-250. 1918 (see *Bot. Absts.* 2, Entries 305, 306; 4, Entry 1413). (2) HOLMES, M. G. Observations on the anatomy of ash-wood with reference to water-conductivity. *Ann. Botany* 33: 255-264. 7 fig. 1919 (see *Bot. Absts.* 3, Entry 1109).] *Bot. Gaz.* 68: 483-484. 1919.

## MINERAL NUTRIENTS

1456. MOLLIARD, M. Action des acides sur la composition des cendres du *Sterigmatocystis nigra*. [Action of acids on the composition of the ash of *Sterigmatocystis nigra*.] *Compt. Rend. Acad. Sci. Paris* 169: 990-993. 1919.—The author has previously demonstrated that the accumulation of ash in *Sterigmatocystis nigra* is much less when ammonium chloride replaces ammonium tartrate as the source of nitrogen. In both cases the acidity increased during the first period of growth, but when the sugar of the culture medium disappears, acidity decreases when ammonium is used, because of the utilization of the latter. On the other hand, the use of ammonium chloride results in the accumulation of hydrochloric acid, which is not utilized by the fungus. During the first 2 days the amount of mineral utilized by the fungus is more than doubled when ammonium tartrate is used as a source of nitrogen. The author regards this result as due to the effect of hydrochloric acid on the permeability of the fungal cells. By means of analyses of the ash of fungi grown with ammonium tartrate and ammonium chloride as sources of nitrogen, the author finds that the mycelium of *Sterigmatocystis* grown on the ammonium tartrate solution contains ash in about the proportions found in the storage organs of higher plants. Only a small part of the sulphur and magnesium of the culture medium was absorbed, but all the phosphorus and potassium of the solution was recovered from the mycelium. The ash of the fungus grown on the ammonium chloride medium was found to contain reduced amounts of sulphur, potassium, and especially magnesium. The author finds that the presence of hydrochloric acid in the medium reduces the permeability of the plasma membrane in an unequal fashion, the permeability to some substances being notably reduced. Attention is also called to the fact that the morphological



characteristics of the fungus, such as suppression of conidia formation, which may be altered by certain deficiencies of the culture medium, may also be brought about by factors leading to alteration in the permeability of the cells.—*V. H. Young*.

### PHOTOSYNTHESIS

1457. GRADENWITZ, A. Carbonic acid gas to fertilize the air. *Sci. Amer.* 123: 549, 557. 3 fig. 1920.—An account is given of some experiments carried out on a commercial scale, in which greenhouses were supplied with purified exhaust gases from blast furnaces. The various plants showed increased growth and yield of fruits of 70 per cent to 180 per cent more than in the case of control plants.—*Chas. H. Otis*.

1458. STOLL, ARTHUR. Ueber die Assimilation der Kohlensäure. [On the assimilation of carbon dioxide.] *Vierteljahrsschr. Naturforsch. Ges. Zurich* 63: 512-543. 1918.—The author gives essentially the following summary: The carbon dioxide diffuses from the intercellular spaces through the cell walls, is brought into a higher concentration by a chemical reaction in the cell, and reaches the chlorophyll in a form especially susceptible to reaction. The carbonic acid as such, or a carbonic acid derivative, is then taken up by the chlorophyll. The chlorophyll molecule with the carbonic acid absorbs light and is surrounded by a specific peroxide enzyme which splits off molecular oxygen. The first free product of assimilation is carbohydrate material whose simplest representative is formaldehyde.—*John H. Schaffner*.

### METABOLISM (GENERAL)

1459. ANDERSON, R. J. Composition of inosite phosphoric acid of plants. *Jour. Biol. Chem.* 44: 429-438. 1920.—The composition of phytic acid of plants as determined from the analyses of salts of this acid corresponds to inosite hexaphosphoric acid.—*G. B. Rigg*.

1460. COOK, M. J., V. MIX, AND E. O. CULVYHOUSE. Hemotoxin production by the *Streptococcus* in relation to its metabolism. *Jour. Infect. Diseases* 28: 93-121. 1921.—Hemotoxin (hemolysin) production by *Streptococcus* is due to, and controlled by, conditions that influence the growth of the organism.—*Selman A. Waksman*.

1461. DOBBIN, L. On the presence of formic acid in the stinging hairs of the nettle. *Proc. Roy. Soc. Edinburgh* 39: 137-142. 1919.—Formic acid was demonstrated in the contents of the hairs by its conversion into lead formate, which could be distinguished by means of a polarizing microscope. Filter papers impregnated with barium carbonate were pressed upon nettle leaves. The papers were extracted with water and the filtered extract acidified with phosphoric acid and then distilled. The distillate was acid in reaction and could be converted into the lead salt.—*Joanne L. Karrer*.

1462. HAAS, P. Organic chemistry. *Sci. Prog.* [London] 14: 378-380, 565-567. 1920.—A brief review of some of the more recent literature on this subject among which are papers dealing with the coloring matter of plants and one by DOBBIN (*Proc. Roy. Soc. Edinburgh* 39: 137-142. 1919—see preceding entry) on the active agent in the stinging hairs of nettles.—*J. L. Weimer*.

1463. HAAS, P. Organic chemistry. *Sci. Prog.* [London] 15: 22-24. 1920.—A brief review of a paper by HAWORTH (*Jour. Chem. Soc.* 117: 199. 1920) on the constitution of disaccharides is included.—*J. L. Weimer*.

1464. HAAS, P. Organic chemistry. *Sci. Prog.* [London] 15: 192-194. 1920.—The diastatic properties of formaldehyde, a new theory of carbon dioxide assimilation, and the gas contained in the floats of the giant Pacific kelp are mentioned.—*J. L. Weimer*.

1465. LAPICDUE, LOUIS. Variation saisonnière dans la composition chimique des algues marines. [Seasonal variation in the chemical composition of marine algae.] Compt. Rend. Acad. Sci. Paris 169: 1426-1428. 1919.—*Laminaria flexicaulis* was selected as typical material for this work. Analysis of the carbohydrate content and of the soluble and insoluble ash showed that there is a distinct seasonal variation in the chemical composition of this alga. From the spring equinox until September there is a steady increase in soluble carbohydrates from 1.1 to 33.9 per cent. At the same time there is a decrease in the soluble ash from 23.2 to 13.4 per cent and of the insoluble ash from 7.5 to 4.6 per cent. Soluble carbohydrates increased from the end of winter to summer in the ratio of 2 to 81. The carbohydrates present are mannite [included for convenience in this group] and laminarine. The author suggests that the disappearance of soluble ash with the increase in soluble carbohydrates may be simply an "isotonic substitution."—V. H. Young.

1466. MÖBIUS, M. Über die Farben der Blumen. [On the colors of flowers.] Ber. Senckenberg. Naturf. Ges. Frankfurt. a. M. 49: 108-109. 1919.—In this report of a lecture given in February, 1919, the biological significance of colors in flowers is stated to be an unsolved problem, if insects are color-blind. In producing the various color-effects the following pigments are the only ones involved: Chlorophyll, anthoxanthin, anthocyan, anthochlor, and anthophaein. These occur, however, in many different arrangements.—A. W. Evans.

1467. MOYCHO, VENCESLAS. Recherches sur le rôle physiologique de la saponine. [Investigations concerning the physiological rôle of saponin.] Rev. Gen. Bot. 32: 449-459. 1920.—Investigations were made of the amount of saponin present at different stages of the development of *Saponaria officinalis*. It was found that the relative amount of saponin present was approximately constant until the time of flowering and seed production, when the amounts present decreased. The glucoside was again accumulated in the roots in the autumn and winter after the foliage had died. The author concludes that the glucoside may be utilized by the reproductive organs of the plant. The accumulation does not depend on the emigration of the glucoside from the leaves but is due to its formation in the storage organs of the plant.—J. C. Gilman.

1468. TANRET, GEORGES. Sur la miellée du peuplier. [On the honey dew of poplar.] Compt. Rend. Acad. Sci. Paris 169: 873-874. 1919.—The "honey dew" which collects on the leaves of *Populus nigra* was collected from 6 kilos of leaves and analyzed by appropriate methods to determine its carbohydrate content. Twenty-two grams of "melezitose" were secured from this amount of leaves. "Honey dew" of poplars appears to be formed by the excretion of minute droplets by plant lice.—V. H. Young.

1469. WITZEMANN, E. J. Disodium phosphate as a catalyst for the quantitative oxidation of glucose to carbon dioxide with hydrogen peroxide. Jour. Biol. Chem. 45: 1-22. 1921.—Glucose may be quantitatively oxidized to CO<sub>2</sub> with hydrogen peroxide in the presence of a phosphate mixture. Disodium phosphate plays the rôle of a typical catalyst in the oxidation.—G. B. Rigg.

#### METABOLISM (NITROGEN RELATIONS)

1470. DAKIN, H. D. Amino acids of gelatin. Jour. Biol. Chem. 44: 499-529. Fig. 1. 1920.—The products of the hydrolysis of gelatin were found to contain 13 amino acids. The ones present in largest amounts were glycine, hydroxyproline, proline, alanine, and arginine.—G. B. Rigg.

1471. JOHNS, C. O., AND C. E. F. GERSDORFF. The globulin of the cohune nut, *Attalea cohune*. Jour. Biol. Chem. 45: 57-67. 1921.—Cohune nut globulin contains all of the basic amino acids known to exist in proteins, being high in arginine and lysine.—G. B. Rigg.

1472. JOHNS, C. O., AND D. B. JONES. Some amino-acids from the globulin of the coco-nut as determined by the butyl alcohol extraction method of Dakin. Jour. Biol. Chem. 44:

283-290. 1920.—The following amino acids were found in the aqueous solution remaining after the products of hydrolysis had been subjected to butyl alcohol extraction (Dakin's method): Glutaminic acid, 19.07 per cent; aspartic acid, 5.12 per cent; alanine, 2.67 per cent; serine 1.76 per cent.—*G. B. Rigg.*

1473. JOHNS, C. O., AND N. C. WATERMAN. Some proteins from the mung bean, *Phaseolus aureus* Roxburgh. *Jour. Biol. Chem.* 44: 303-317. 1920.—The mung bean contains about 21.74 per cent of protein. This yields 2 globulins distinguished from each other by marked differences in their percentages of the basic amino acids.—*G. B. Rigg.*

1474. JONES, D. B., AND C. O. JOHNS. Hydrolysis of the globulin of the coconut, *Cocos nucifera*. *Jour. Biol. Chem.* 44: 291-301. 1920.—The amino acids resulting from the hydrolysis were determined. Glytaminic acid was the most abundant.—*G. B. Rigg.*

1475. MILLER, E. R. Dihydroxyphenylalanine, a constituent of the velvet bean. *Jour. Biol. Chem.* 44: 481-486. 1920.

1476. PARIS, G. Studi e ricerche sulla biochimica del tabacco. III. Sul metabolismo dell'azoto nello sviluppo della foglia di tabacco. [The biochemistry of tobacco. III. Nitrogen metabolism in the growing leaf.] *Staz. Sper. Agrarie Ital.* 53: 81-96. 1920.—The direct connection existing between nicotine production and nitrogen nutrition was demonstrated by cutting tobacco leaves longitudinally in two equal parts and allowing one part to float on distilled water, while the other was floated upon a 0.25 per cent solution of  $\text{NH}_4\text{Cl}$  in diffuse light. The content of nicotine of the ammonium chloride portions was found in two cases to be 2.22 and 2.01 respectively, while the natural nicotine content of the water portions was 1.88 and 1.54 per cent respectively.—The physiological effect of "topping" is demonstrated. In the natural plant the total nitrogen and also the amide nitrogen (about  $\frac{1}{3}$  the total amount) increased from the basal to the 5th whorl, while the nicotine content, averaging  $\frac{1}{3}$  the quantity of total nitrogen, diminished. In the "topped" plant total nitrogen and nicotine content run about parallel and the latter is so increased in amount as to exceed total nitrogen, and a low content of amide nitrogen is present.—As for soluble nitrogen, the observation was made that, while in the "topped" plants the greater proportion was in the form of basic and protein substances, in the natural plants the greater part of the soluble nitrogen was in the amidic form. Therefore, "topping" of the plants leads to a modification of the chemical composition of the leaves and the stem with an accumulation of nicotine and strong diminution of amides. According to the author, nicotine is a condensation product, the formation of which is dependent upon the amides, light, and chlorophyll.—*A. Bonazzi.*

#### METABOLISM (ENZYMES, FERMENTATION)

1477. ARZBERGER, C. F., W. H. PETERSON, AND E. B. FRED. Certain factors that influence acetone production by *Bacillus acetoethylicum*. *Jour. Biol. Chem.* 44: 465-479. *Fig. 1-2.* 1920.—This organism ferments glucose, sucrose, potato starch, and xylose in a peptone-phosphate medium with the production of acetic, formic, and lactic acids, ethyl alcohol, acetone, and carbon dioxide.—*G. B. Rigg.*

1478. BOURQUELOT, EM., ET H. HÉRISSEY. Présence dans le Mélilot et l'Asperule odorante, de glucosides fournissant de la coumarine sous l'action hydrolysante de l'émulsine. [The presence in *Melilotus* and *Asperula odorata* of glucosides furnishing coumarine when hydrolyzed with emulsin.] *Compt. Rend. Acad. Sci. Paris* 170: 1545-1550. 1920.—Coumarine is secured by treating the glucosides of these plants with enzymes extracted from them. The same result is obtained if emulsin is used, both sugar and coumarine being formed from the glucosides.—*C. H. Farr.*

1479. BRADLEY, H. C., AND H. FELSHER. Studies of autolysis. VI. Effect of certain colloids upon autolysis. *Jour. Biol. Chem.* 44: 553-561. 1920.



1480. GARINO-CANINA, E. Azione dei fosfati nella fermentazione alcoolica. [The action of phosphates in alcoholic fermentation.] Staz. Sper. Agrarie Ital. 53: 67-78. Fig. 1. 1920.—A yeast (no. 121) of the collection of the laboratory is cultivated in a medium made up of saccharose, tartaric acid, potassium carbonate, potassium sulphate, magnesium sulphate, calcium chloride, and asparagine to which varying quantities of potassium phosphate have been added before sterilization. [The author does not mention which of the 3 phosphates was used.] After incubation the cultures are filtered and alcohol, acetic acid, and yeast substance are determined and compared with the quantity of carbon dioxide produced. The results obtained are summarized in 2 tables and a graph, whence the conclusions are reached that even a molecular concentration of  $0.000052 \text{ PO}_4'''$  is sufficient to bring about a normal development and alcohol formation while a concentration of  $0.0104 \text{ mol. PO}_4'''$  gives the best results. When alcohol formation is taken as a standard, it is found that greater concentrations are not quite so favorable, while if the actual weight of dry yeast is considered, then growth is a direct function of phosphate concentration within the limits studied. Experiments made with compressed yeast and dipotassium phosphate in increasing concentrations, as also with acetone yeast (*zymin*), gave results which the author considered confirmatory to the results obtained with living yeast although quite irregular.—A. Bonazzi.

1481. GREY, EGERTON CHARLES. The enzymes of *B. coli communis* which are concerned in the decomposition of glucose and mannitol. Part IV.—The fermentation of glucose in the presence of formic acid. Proc. Roy. Soc. London B, 91: 294-305. 1920.—This organism breaks glucose down into 3 groups of products: (1) Lactic acid; (2) acetic acid, alcohol, and succinic acid; and (3) carbon dioxide, hydrogen, and formic acid. Production of lactic acid is not correlated with that of the other groups, which are in turn, however, closely related. This relation, due to the rôle of nascent hydrogen in forming alcohol, is here demonstrated for the first time *in vivo*. The addition of formic acid as calcium formate greatly increases the production of hydrogen and of carbon dioxide, instead of inhibiting their formation.—Paul B. Sears.

1482. KNUDSON, L., AND R. S. SMITH. Secretion of amylase by plant roots. Bot. Gaz. 68: 460-466. 2 fig. 1919.—Neither *Zea Mays* nor *Pisum arvense* is capable of utilizing soluble starch, nor was there found in any experiment an appreciable secretion of amylase by the roots.—H. C. Cowles.

1483. KOPELOFF, NICHOLAS, AND LILLIAN KOPELOFF. Factors determining the keeping quality of cane sugar. Louisiana Agric. Exp. Sta. Bull. 170. 63 p., 1 fig. 1920.—This is practically a reprint of several articles appearing in different journals (see Bot. Absts. 4, Entry 1513; 5, Entries 920, 2202) with conclusions regarding the importance of certain species of *Penicillium* and *Aspergillus* in the deterioration of sugar.—C. W. Edgerton.

1484. KOPELOFF, NICHOLAS, AND H. Z. E. PERKINS. The deterioration of Cuban raw sugars in storage. Louisiana Planter and Sugar Manufacturer 64: 413-415. 1920.—Cuban raw sugars stored for  $5\frac{1}{2}$  months in New Orleans deteriorated to a considerable extent. During the same period there was an increase in the number of microorganisms present.—C. W. Edgerton.

1485. KOPELOFF, NICHOLAS, H. Z. E. PERKINS, AND C. J. WELCOME. Further studies in the deterioration of sugars in storage. Jour. Agric. Res. 20: 637-653. 1921.—Bags of Cuban raw sugars of 10 different lots with moisture ratios varying from 0.18 to 0.5 were stored in a large warehouse and were analyzed chemically and bacteriologically at the beginning of storage and after 4 and 8 weeks respectively. There was a loss in polarization in most of the sugars at the end of each period, and this was usually accompanied by a gain in reducing sugars and in moisture content. From the data secured a correlation is established between deterioration and the number of microorganisms present and between deterioration and the moisture ratio. [See Bot. Absts. 7, Entry 1343.]—D. Reddick.

1486. SATAVA, JAN. Alcoholic fermentation in sugar juices. *Sugar* 22:196-198. *Fig. 1-4*. 1920.—[Translated from the report of the Bohemian Technical High School, Prague, by R. V. Keller.] Several strains or species of the genus *Zygosaccharomyces*, closely related to *Z. Barkeri*, are capable of fermenting concentrated solutions of sugar. The fermentation produced is rather vigorous, though the amount of alcohol produced is not large. In one experiment using a 65 per cent sugar solution, 2.69 per cent of alcohol was obtained.—C. W. Edgerton.

1487. WESTER, D. H. Ureasegehalt von holländischen Samen und von verschiedenen Arten Soyabohnen. [Urease content of Dutch seeds and of different kinds of soy beans.] *Pharm. Zentralhalle* 61: 377-382. 1920.—A great number of seeds of plants growing in Holland and the Dutch possessions were examined. The seeds of *Cytisus* have a high urea number. In seeds of different species of the same genus the urea number varies considerably in such genera as *Geranium*, *Trifolium*, *Vicia*, and *Phaseolus* for instance. In *Vicia hirsuta*, *V. cracca*, *V. villosa*, *V. angustifolia*, and *V. sativa* no urease was present, while in *V. silvatica* there was a high urea number. Urease was present in all the different kinds of soybeans, as found by the examination of 48 species. Very remarkable was the fact that beans which had been kept for 17 and 31 years still exerted a strong urease action.—H. Engelhardt.

### METABOLISM (RESPIRATION)

1488. HAGGARD, H. W., AND Y. HENDERSON. Hemato-respiratory functions. VII. The reversible alterations of the  $\text{H}_2\text{CO}_3$ :  $\text{NaHCO}_3$  equilibrium in blood and plasma under variations in  $\text{CO}_2$  tension and their mechanism. *Jour. Biol. Chem.* 45:189-198. 1 *fig.* 1920.—Hemoglobin plays almost as large a part in the transportation of  $\text{CO}_2$  as it does in that of oxygen, though it does not itself combine directly with  $\text{CO}_2$  to any great extent.—G. B. Rigg.

### ORGANISM AS A WHOLE

1489. BRANDT, K. Über den Stoffwechsel im Meere. [Metabolism in the sea.] *Schriften Naturwiss. Ver. Schleswig-Holstein* 17: 193-194. 1920.—A report is given here of a lecture on the periodicity of the plankton algae, especially the diatoms. Definite relations are shown to exist between the abundance of these organisms and the amount of certain nutritive substances present in the sea.—A. W. Evans.

1490. KÜSTER, E. Der Rhythmus im Leben der Pflanze. [Rhythm in the life of the plant.] *Ber. Senckenberg. Naturf. Ges. Frankfurt a. M.* 47: 69. 1919.—In this report of a lecture delivered in February, 1916, various periodic processes in plants are ascribed, wholly or very largely, to an autonomous rhythm inherent in the organism. Among these processes the following are included: Alternation of growing and resting periods, alternation of day and night positions in many leaves and flowers, the formation of fairy rings by molds, and the development of annual rings in woody plants.—A. W. Evans.

1491. ROGERS, J. B. Studies on the viability of the tubercle bacillus. *Amer. Jour. Public Health* 10: 345-347. 1920.—The author describes experiments which go to show that the tubercle bacilli in the dust of hospital wards and in morgues are viable and infective.—C. A. Ludwig.

1492. TUBEUF. Absterben der Ulmenäste im Sommer 1920. [Dying-off of the branches of the elm in the summer of 1920.] *Naturw. Zeitschr. Forst- u. Landw.* 18: 228-230. 1920.—This phenomenon was observed to an equal extent in 1918, and is due to the habit, characteristic of the elm, of flowering very abundantly every 2nd or 3rd year. The blossoms appear before the foliage in the spring, and, although the green fruits may temporarily act as leaves before becoming ripe, they deprive the leaf buds of their required nourishment, and, as often happens, the foliage never develops so that the branches, after the fruit drops, are bare. Twigs and branches remain green just as long as they bear foliage,—if the foliage does not develop, the branches die off, or die back to the outermost foliage.—J. Roesser.

## GROWTH, DEVELOPMENT, REPRODUCTION

1493. SALISBURY, E. J. [Rev. of: MACDOUGAL, D. T. Hydration and growth. Carnegie Inst. Washington Publ. 297. vi + 176 p., 52 fig. 1920 (see Bot. Absts. 5, Entry 2223).] Sci. Prog. [London] 15: 319. 1920.

## MOVEMENTS OF GROWTH AND TURGOR CHANGES

1494. HENDRICKS, H. V. Torsion studies in twining plants. Bot. Gaz. 68: 425-440. 6 fig. 1919.—These studies were made on *Phaseolus multiflorus* and *Tiniaria Convolvulus* with a modified form of auxanometer, the latter being so arranged that the growing internodes were stretched vertically in order to eliminate twining. An estimate of torsional rigidity at different lengths was made, and studies were begun on antidromous torsion. As the internode begins to elongate it twists but little, but later it twists more rapidly; eventually there is a slight reverse twist. Rigidity or resistance to twisting increases but slowly until nearly the end of the period of elongation, when there is a sudden increase. The final increase in rigidity accompanies lignification.—H. C. Cowles.

1495. MÖBIUS, M. Die Pflanze und die Schwerkraft. [The plant and gravity.] Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 47: 78-79. 1919.—In this report of a lecture on geotropic phenomena the contrast is brought out between the uniformity of the actual sensory organs and the diversity of the responses.—A. W. Evans.

## GERMINATION, RENEWAL OF ACTIVITY

1496. CROCKER, WILLIAM. After-ripening and germination of rice. [Rev. of: KONDO, MONTARO. Ueber Nachreife und Keimung verschieden reifer Reiskörner. Ber. Ohara Inst. Landw. Forsch. 1: 361-387. 1919 (see Bot. Absts. 3, Entry 2805).] Bot. Gaz. 68: 484. 1919.

1497. THIEL, A. F., AND FREEMAN WEISS. The effect of citric acid on the germination of the teliospores of *Puccinia graminis tritici*. Phytopath. 10: 448-452. 1 fig. 1920.—Means were sought for shortening the rest period of *Puccinia graminis Tritici* teliospores. Soaking in 1 per cent citric acid hastened after-ripening so that germination occurred in December, January, and February. Spores treated the optimum time (15 minutes) produced sporidia capable of infection.—E. K. Seymour.

1498. WEST, CYRIL. Plant physiology. Sci. Prog. [London] 15: 34-39. 1920.—This paper contains a brief review of the more recent literature on dormancy, or delayed germination of seeds.—J. L. Weimer.

## TEMPERATURE RELATIONS

1499. ANONYMOUS. The effect of high temperatures on fruits. Sci. Amer. Monthly 2: 272. 1920.—This is a summary of the results of OVERHOLSER and TAYLOR, as set forth in their article in the Bot. Gaz. 69: 274-296. 1920.—Chas. H. Otis.

1500. LIVINGSTON, B. E., AND H. S. FAWCETT. A battery of chambers with different automatically maintained temperatures. Phytopath. 10: 336-340. 1920.—The water is electrically thermostated at the extremes, the intermediate chambers assuming temperatures determined by the temperature-gradient that exists between the 2 ends.—James Johnson.

## RADIANT ENERGY RELATIONS

1501. ANONYMOUS. Plant movement and radiant energy. Sci. Amer. 123: 631. 1920.
1502. PRINGSHEIM, E. G. Vom Lichtsinn der Pflanzen. [Light perception by plants.] Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 47: 57-58. 1919.—A synopsis of a lecture



on light perception in plants is here given. The various types of phototropic phenomena are described and explained, and the great delicacy of the powers of light perception exhibited by plants is presented.—*A. W. Evans.*

1503. TROENDLE, ARTHUR. Der Einfluss des Lichtes auf die Permeabilität der Plasmahaut und die Methode der Permeabilitäts-Koeffizienten. [The influence of light on the permeability of the plasma-membrane and the method of coefficients of permeability.] Vierteljahrsschr. Naturforsch. Ges. Zurich 63: 187-213. 1918.—The results of an earlier contribution (1910) on coefficients of permeability are confirmed. New experiments, in which the quantity of salt taken up in a given time was determined, confirmed the earlier conclusions. The relations between the coefficients of permeability ( $\mu$ ) and the quantity of salt taken up per minute are theoretically derived.—*John H. Schaffner.*

### TOXIC AGENTS

1504. VERSCHAFFELT, ED. Een en ander over de Werking van gasvormige vergiften op planten. [The action of gaseous poisons on plants.] Pharm. Weekbl. 57: 1163-1175. 1920.—The gases may enter the plant by diffusion through the cuticle, which generally covers those organs which have only a limited life; or through the tissue air spaces or the lenticels of the cork tissue, the latter behaving differently with different plants. Trees and shrubs shed their leaves very rapidly when exposed to illuminating gas or the vapors of oil of cloves. Strong quick-acting poisons such as chloroform, hydrochloric acid vapors, and ammonia prevent a meristematic separation of the cells, and the leaves do not fall off until the plant is dead. Some Coniferae with definite cell layers in the needles shed these needles when exposed to chloroform or other poisons. The shedding is the more rapid the more poison is absorbed by the cork. This absorbs in 7 days 334.7 per cent of chloroform, 56.6 per cent of ether, 26.4 per cent of carbon tetrachloride, 176.7 per cent of 10 per cent alcoholic caustic potash solution, and 327.8 per cent of trichloroacetic acid (25 gms. in 10 mils of water). The saponifiable substances in the cutin and suberin appear to play an important rôle in the poisoning of plants by gases. Anthocyan dyes are converted into white isomerids, the color being restored by hydrochloric acid vapors. In some plants enzymes may take an important part in hastening the poisoning. In some cases of poisoning strong odors are developed, for instance, by the action of chloroform on garlic and related plants, where from glucosides present in these plants alkyl sulphides are split off, which can be identified by lead acetate paper.—*H. Engelhardt.*

### MISCELLANEOUS

1505. ANONYMOUS. Presence of copper in food plants. Sci. Amer. Monthly 2: 204. 1920.

1506. WILSON, J. K. Device for growing large plants in sterile media. Phytopath. 10: 425-429. 1 fig. 1920.—The seeds are sterilized with calcium hypochlorite and germinated in a short glass cylinder partially imbedded vertically in sterile agar contained in a test tube. After the seeds germinate the cylinder containing agar and seedling is lifted out of the tube and set into the mouth of a large flask which contains sterilized nutrient solution. Maize, peas, and oats have been grown to maturity by this method.—*William B. Tisdale.*

1507. ZERBAN, F. W., AND E. C. FREELAND. The color of sugar cane products and decolorization in factory practice. Sugar 21: 354-359b. 1919.—This is a reprint of Louisiana Agric. Exp. Sta. Bull. 165. 32 p. 1919 (see Bot. Absts. 3, Entry 815).—*C. W. Edgerton.*

1508. ZERBAN, F. W., Y E. C. FREELAND. El color de los productos de la cana de azucar y su decoloracion en la practica azucarera. [The color of sugar cane products and decolorization in factory practice.] Sugar 21: 444-447, 494-499. 1919.—This is a translation of Louisiana Agric. Exp. Sta. Bull. 165 (see preceding Entry).—*C. W. Edgerton.*

## SOIL SCIENCE

J. J. SKINNER, *Editor*F. M. SCHERTZ, *Assistant Editor*

(See also in this issue Entries 772, 773, 774, 775, 805, 806, 810, 811, 813, 814, 935, 1087, 1177, 1453, 1582)

## INFLUENCE OF BIOLOGICAL AGENTS

1509. COWIE, G. A. The mechanism of the decomposition of cyanamide in the soil. *Jour. Agric. Sci.* 10: 163-176. *Fig. 1-5.* 1920.—The decomposition of cyanamide in the soil has been attributed by certain workers to the action of bacteria. The author finds that his results coincide with those of ULPANI, who holds that cyanamide breaks down to urea by a purely chemical change. Sterile soils were capable of transforming cyanamide to urea but little or no ammonia was produced under such conditions. Urea is broken down to ammonia by a change which appears to be due to the action of soil organisms. Clay soils are more efficient in the breaking down of cyanamide to urea than are sandy soils. A sample of Thanet sand taken from borings through London clay was found capable of breaking down cyanamide even after ignition. This sand was found to have the power of softening water as have zeolites. Following this clue it was found that the effect of adding a definite zeolite, prehnite, to ordinary inert quartz sand was to produce a mixture capable of converting cyanamide to urea. Urea was found to accumulate in sterile soils when cyanamide was added.—V. H. Young.

1510. CRUMP, LETTICE M. Numbers of protozoa in certain Rothamstead soils. *Jour. Agric. Sci.* 10: 182-198. *20 fig.* 1920.—Methods are described for counting the protozoa of soil, which are adaptations of the methods commonly used for estimating soil bacteria. Two soils are dealt with in detail—a well manured arable soil and a soil which had had comparatively small applications of manure. Flagellates, amoebae, and thecamoebae are usually present in these soils in large numbers, and in the trophic condition are practically confined to the top 6 inches of soil. There is a definite inverse relation between the number of bacteria and amoebae. Variations in the water content and temperature of soils as well as the rainfall have no influence on soil amoebae. Soils rich in organic matter are richer in protozoa and especially in amoebae and thecamoebae. A bibliography of 23 citations is included.—V. H. Young.

1511. CUTLER, D. W. A method for estimating the number of active protozoa in the soil. *Jour. Agric. Sci.* 10: 135-143. 1920.—A method is described by which it is possible to estimate the numbers of active protozoa in a soil. The total number of protozoa is first found by a dilution method and a fresh portion of the soil is then treated with 2 per cent HCl (sp. gr. 1.15) overnight. By this means all active forms are killed. A second count by the dilution method gives the number of cystic protozoa in the soil.—V. H. Young.

1512. DAVIS, JOHN J. Miscellaneous soil insecticide tests. *Soil Sci.* 10: 61-75. *Pl. 1-2.* 1920.—In field experiments on the control of the commoner white grubs 1 gallon of 8-10 per cent kerosene emulsion per 6-8 square feet of soil washed in with water, slightly browned the tips of the grass. Sodium cyanide at the rate of 165 lbs. in 12,000 gallons of water per acre appreciably injured cultivated crops like corn but produced no permanent injury to grass. Sodium cyanide treatment was more effective in controlling white grubs than kerosene emulsion or coal tar products.—W. J. Robbins.

1513. KOMP, WILLIAM H. WOOD. The use of carbon bisulfide against the white grub. *Soil Sci.* 10: 15-28. 1920.—The maximum dosage of carbon bisulfide for ordinary lawn and golf-green grasses lies nearer 5 ounces than 1 ounce per square foot. The minimum dosage for the white grub is 1 ounce, and injections should be made about 6 inches apart and below the grubs. The soil should be medium moist to wet.—W. J. Robbins.

1514. MATTHEWS, DONALD J. The determination of ammonia in soil. *Jour. Agric. Sci.* 10: 72-85. 2 fig. 1920.—Various methods of determining ammonia in soils have resulted in figures that are too high due to the simultaneous decomposition of nitrogenous compounds. The author describes and figures "aeration apparatus" with which it is possible to recover large quantities of added ammonia with an accuracy of 98-99.5 per cent in 6 hours and with nearly equal accuracy in 3 hours. For most agricultural purposes an aeration of  $1\frac{1}{2}$  hours is sufficient. Highly manured glass-house soils undergo partial decomposition in the cold with magnesia. In such cases a modification of the method is recommended. The complete recovery of added ammonia from a calcareous soil is difficult unless the soil is finely ground.—V. H. Young.

1515. PLYMEN, F. J., AND D. V. BAL. The biological aspects of wheat cultivation on embanked soils. *Agric. Jour. India* 15: 289-300. 1920.—Embanked wheat soils were said to be deteriorating giving low yields, and wheat plants grown on them were weak and yellow during the early stages of growth but recovered later. The soils are heavy and sticky, black in color, get very hard, and form tenacious blocks on drying after rains. They possess good powers for ammonification and nitrogen fixation but nitrification proceeds rather slowly. The retarding effect on young wheat plants may be due to lack of available nitrogen or to the presence of some deleterious substance formed under anaerobic conditions. Cultivation and aeration during the monsoon months removes the cause.—F. M. Schertz.

1516. PRESCOTT, JAMES ARTHUR. A note on the Sheraqi soils of Egypt. A study in partial sterilization. *Jour. Agric. Sci.* 10: 177-181. Fig. 1. 1920.—During the "sheraqi," or fallow period, in the region of the Nile, the soil becomes extremely dry and greatly cracked. The temperature is maintained at a point near  $40^{\circ}\text{C}$ . for some time. The author shows that this results in partial sterilization of the soil with a great decrease in the number of soil protozoa. Such soils when sampled and moistened up to 20 per cent showed greatly increased bacterial action over soils which were obtained before being subjected to the normal high temperatures and consequent partial sterilization. In partly sterilized soils there was a more rapid accumulation of available nitrogen parallel with that obtained following artificial soil sterilization.—V. H. Young.

1517. RUSSELL, E. J., AND E. H. RICHARDS. The washing out of nitrates by drainage water from uncropped and unmanured land. *Jour. Agric. Sci.* 10: 22-43. Fig. 1-6. 1920.—The results secured in a series of drain gauges at Rothamstead show that uncropped land persistently loses nitrogen in the form of nitrates but the rate at which the soil loses its power of producing nitrates from its own stock of nitrogenous compounds is relatively slow. At the beginning the first 9 inches of soil contained about 3500 lbs. of nitrogen per acre and yielded about 40 lbs. of nitrogen per acre to the drainage water. At the end of 50 years the soil still contains 2380 lbs. of nitrogen and is giving it up at the rate of 21 lbs. of nitric nitrogen per acre per annum. If the curve showing the rate of fall continued its present course and without further slowing down no less than 150 years would be needed for exhaustion of the nitrogen of the soil. The nitrogen lost from the soil appears in the drainage water wholly as nitrate. The authors find evidence from which they conclude that the subsoil contributes little if anything to the nitrogen content of the soil water. The analyses give no evidence of either the loss of gaseous nitrogen or of nitrogen fixation. The amount of nitric nitrogen in the drainage water is found to be closely related to the amount of rainfall. The months of greatest rainfall, in general October to January inclusive, are the months of greatest nitrate loss. During the last 25 years, 1 inch of water has washed out 1 lb. of nitrogen per acre, and for the 15 years previous to that the rate was 1.1 lb. Soil in situ does not give up its nitrogen as easily as when washed in ordinary laboratory experiments. A close relation between sunshine and soil temperature is revealed and it is found that a period of bright sunshine during the summer months results in an increase in nitrate loss during the succeeding rainy months. The amounts of nitrogen lost and the relation of rainfall, temperature, etc., to nitrate loss are shown in a number of graphs and tables giving the data obtained.—V. H. Young.



## FERTILITY STUDIES

1518. ANONYMOUS. [Rev. of: NEWMAN, L. F., AND H. A. D. NEVILLE. *A course of practical chemistry for agricultural students*. Vol. I. 235 p. Cambridge University Press: 1920.] *Sci. Prog.* [London] 15: 321-322. 1920.

1519. BENNETT, HUGH H. *The soils and agriculture of the Southern States*. 15 × 20 cm., 399 p., 54 pl., 6 maps (1 colored). The Macmillan Company: New York, 1921.—The important agricultural lands of the southern portion of the United States are described. The various soil types occurring are described and crops best suited for their growth discussed. The soil provinces are grouped into (1) the Atlantic and Gulf coastal plains, (2) the Piedmont plateau, (3) the Appalachian Mountain province, (4) the limestone valleys and uplands, (5) Mississippi bluffs and silt loam uplands, (6) the Great Plains region, (7) central prairie region, and (8) the stream bottom and second bottom soils. The fertilization of the various soil types for specific crops is discussed. In Appendix A the definition of a soil is given together with a classification of soil material by texture. In Appendix B tables are given showing the results of chemical analyses of some representative soils from widely separated localities in the Southern States. In Appendix C a list of publications on soils, soil physics, soil chemistry, soil management, crops, and livestock is given. In Appendix D statistics are given bearing on some of the important farm products of the Southern States.—*J. J. Skinner*.

1520. COMBER, NORMAN M. *A qualitative test for sour soils*. *Jour. Agric. Sci.* 10: 420-424. 1920.—A method is described whereby soils which are acid in nature and for which a lime requirement is indicated can be tested qualitatively. Solutions from such soils when treated with an alcoholic or ether-alcohol solution of potassium thiocyanate produce a coloration varying from an opaque red to pink, which indicates the formation of ferric thiocyanate. This method was tested out on a comparatively large number of acid soils with the result just described.—*V. H. Young*.

1521. ELETTE, W. B., AND T. K. WOLFE. *The relation of fertilizers to Hessian fly injury and winterkilling of wheat*. *Jour. Amer. Soc. Agron.* 13: 12-14. 1921.—In Virginia when acid phosphate or manure is used, the Hessian fly injury is smaller and the yield greater than when manure is not used or when floats are applied in place of acid phosphate.—Fly injury ranges from 4.79 per cent in the manure-acid phosphate plot to 28.96 per cent in the buck-wheat-floats-lime plot. The manure plot suffered 10.64 per cent fly injury, which was next to the lowest. Manure has greatly prevented winter killings, as shown by yields. Results show that the element most needed to increase yields and decrease the amount of winter-killing is phosphorus. Practically all Virginia soils are deficient in phosphorus and that element must be supplied before material increases can be secured.—*F. M. Schertz*.

1522. HARTWELL, BURT L., AND S. C. DAMON. *Six years experience in improving a light unproductive soil*. *Jour. Amer. Soc. Agron.* 13: 37-41. 1921.—A Warwick sandy loam in Rhode Island was used. To increase productivity liming and fertilization with phosphate should be first considered. Legumes are beneficial for collecting nitrogen and increasing humus.—*F. M. Schertz*.

1523. JENKINS, E. H., AND W. L. SLATE, JR. *Concerning the use of fertilizers*. Connecticut [New Haven] Agric. Exp. Sta. and Storrs Agric. Exp. Sta. Joint Bull. 4. 5 p. 1921.—This paper gives some general principles that may govern the use of fertilizers. Special suggestions are given for the use and purchase of mixed fertilizers and chemicals together with suggestions for applications on mowings, potatoes, corn, tobacco, orchards, and gardens. Facts for calculating formulae are given. The publication is intended for general use.—*Henry Dorsey*.

1524. LIPMAN, C. B., AND G. A. LINHART. *A critical study of fertilizer experiments*. *Proc. Nation. Acad. Sci.* 6: 684-686. 1920.—A preliminary report on a statistical study of the

results of fertilizer experiments at the Ohio and Pennsylvania agricultural experiment stations. Study of the Ohio data shows significant increases in yield on "two-element" and "three-element" plots, but not on "one-element" plots. The authors conclude that, even with the best methods, our present knowledge of the enormous variability of all soils and plants render the data from any given fertilizer plot of value only on that plot, and renders it highly probable that no fertilizer experiment as ordinarily conducted is possessed of sufficient practical value to justify the large expenditure of money, time, and energy involved.—*Howard B. Frost.*

1525. MAQUENNE, L., ET E. DEMOUSSY. Sur la richesse en cuivre de terres cultivees. [The amount of copper in cultivated soils.] *Compt. Rend. Acad. Sci. Paris* 169: 937-942. 1919.—The purpose of the work undertaken was to determine whether or not the copper introduced in soils by use of copper sprays may become injurious to plants. Samples (140) of vineyard and other soils were analyzed and the amount of copper was found to vary from less than 1 milligram per kilo to as much as 250 milligrams in some cases. The amount of calcium did not appear to have any direct bearing on the amount of copper retained by soils, but various soils were variable in their retaining power. In general, vineyard soils which had been subjected to copper sprays over a long series of years were found to contain the greatest amounts of copper. Most of this copper is retained in the first 0.3 meter of soil. Observations on the amount of copper taken up by plants and on the amount of soluble copper in the soil lead to the conclusion that the copper of cultivated soils is not injurious to plants.—*V. H. Young.*

1526. MASONI, G. La reazione alcalina provocata dagli acidi nelle terre in rapporto alla nutrizione delle piante. III. Solubilizzazione dei fosfati nel terreno. [The relation to plant nutrition of the alkaline reaction brought about by soil acids. III. Solubility of phosphates in the soil.] *Staz. Sperim. Agrarie Ital.* 53: 121-137. 1920.—A continuation of researches brought to bear on the question of the complex chemical reactions in the soil, the making soluble of substances insoluble in water, and plant chlorosis. Various mineral or organic acids were allowed to act upon the insoluble phosphates in the presence of an excess of  $\text{CaCO}_3$ . The acids used were hydrochloric, nitric, sulphuric, formic, acetic, oxalic, succinic, malic, tartaric, and citric. The influence of the temperature upon the various changes was also studied and it was found that, especially when water was used alone, the solubility of  $\text{Ca}_3(\text{PO}_4)_2$  was enhanced by a rise in temperature. The principal result of these investigations is to be found in the fact that in the presence of an excess of  $\text{CaCO}_3$  the acids which left more phosphorus in solution were citric and malic, while the stronger acids left smaller quantities of this element in solution. These results are similar to those the author obtained when manganese and iron salts were used instead of calcium compounds. The behavior of the different acids the author ascribes to the OH ion developed, through their interaction with the calcium carbonate, and the influence of this upon the mono or dicalcium phosphate in solution and the resulting precipitation of the tricalcium salt. The presence of this OH ion is regulated by (a) the strength of the acid, and (b) the temperature at which the action takes place. It is concluded that the phenomenon of calcareous chlorosis affecting various species of plants grown on a calcareous soil, to a different degree, may be not only dependent upon a lack of iron but also of phosphorus.—*A. Bonazzi.*

1527. MOUNT, H. A. Fuel or fertilizer? *Sci. Amer.* 123: 498, 509-510. 3 fig. 1920.—A discussion of America's little-known peat bogs and their present utilization.—*Chas. H. Otis.*

1528. OPAZO, ROBERTO. Aplicacion de la cal a los terrenos de cultivo. [Application of lime to cultivated soils.] *El Agricultor* [Santiago, Chile] 5: 48-51. 1920.

1529. SEBELIEN, JOHN. Modern methods for experiments with fertilizers and manures. *Jour. Agric. Sci.* 10: 415-419. 1920.—The extreme variation between trial plots, amounting in some cases to as much as 100 per cent under the same treatment, leads to the conclusion that ordinary field plots are of little scientific value in studies with fertilizers and manures.

Pot experiments are of great value in accurate physiological experimentation but cannot be used to solve many problems connected with fertilizers. Various systems of arranging small plots and checks provide a method of compensating for the natural inequalities to be found in ordinary plots. Systems in vogue in a large number of experiment stations are described.—*V. H. Young.*

1530. STEWART, G. R., AND J. C. MARTIN. **Effect of various crops upon the water extract of a typical silty clay loam soil.** Jour. Agric. Res. 20: 663-667. 5 fig. 1921.—The effects of crops of maize, horse beans, potatoes, turnips, and barley upon the water extract of Yolo silty clay loam was studied. Each crop reduced the concentration of the aqueous extract. The nitrate content was reduced to a very low figure.—Concentration of soil solution is not reduced significantly until the portion of soil sampled is filled with roots.—*D. Reddick.*

1531. WALKER, SETH S. **Chemical composition of some Louisiana soils as to series and texture.** Louisiana Agric. Exp. Sta. Bull. 177. 27 p. 1920.—The chemical analysis of 67 soils and 64 subsoils, representing 27 soil types in the Long Leaf Pine Belt of Louisiana, is given together with a general discussion.—*C. W. Edgerton.*

### PHYSICAL INVESTIGATIONS

1532. BOUYOUCOS, GEORGE. **Degree of temperature to which soils can be cooled without freezing.** Jour. Agric. Res. 20: 267-269. 1920 [1921].—Mineral soils may be supercooled to  $-4.2^{\circ}\text{C}.$  without freezing; peats and mucks withstand  $-5^{\circ}\text{C}.$ ; water, gelatin, agar, etc., may be supercooled to  $-6^{\circ}\text{C}.$  No definite explanation of the phenomenon is offered but theoretical considerations are presented. "The ability of soils to resist freezing even when their temperature is much below the freezing point throws considerable new light on [biological] questions regarding the temperature of soils in cold seasons."—*D. Reddick.*

1533. COMBER, NORMAN M. **The flocculation of soils.** Jour. Agric. Sci. 10: 425-436. 1920.—This is a study of the effect of calcium salts in the flocculation of soils. Silt is most easily flocculated by calcium salts when the suspension is neutral. The addition of alkali renders the flocculation more difficult. Soil "clay" behaves in an opposite manner and is precipitated from alkaline suspensions more readily than from neutral ones. This behavior suggests that of "emulsoid" colloids and it is suggested that clay particles are protected by emulsoid colloids and so behave like them. If this is true, the action of lime is seen to be in accordance with the known facts of colloidal chemistry. Clay as an emulsoid is conceived to protect larger particles which are "suspensoid" in nature. Thus clay imposes its emulsoid nature on soil aggregates and thus on the whole soil. Fine silts are lacking in "emulsoid" clay to protect the larger "suspensoid" particles and are consequently not flocculated by calcium hydroxide.—*V. H. Young.*

1534. HOAGLAND, D. R., AND J. D. MARTIN. **Effect of season and crop growth on the physical state of the soil.** Jour. Agric. Res. 20: 397-404. 1920 [1921].—"The physical state of certain soil constituents is influenced to a marked degree by the concentration of the soil solution. The colloidal condition of the soil suspension undergoes significant alterations during the season. A large increase in colloidal matter is noted when the soil solution is depleted as a result of absorption of solutes by the plant."—*D. Reddick.*

1535. KEEN, BERNARD A. **The relations existing between the soil and its water content. A résumé of the subject.** Jour. Agric. Sci. 10: 44-71. 1 fig. 1920.—A review of the subject, with numerous citations, is presented. Emphasis is laid on the colloidal nature of soil and the necessity of attacking the problem of soil moisture from this point of view.—*V. H. Young.*

1536. MORETTINI, A. **Un decennio di ricerche sull'arrabbiaticcio.** [Ten years of study upon the subject of "arrabbiaticcio."] Staz. Sperim. Agrarie Ital. 53: 146-171. 1920.—The condition of the soil that receives in Italy the name of "arrabbiaticcio" and in France the name of "terre-gatee" has been known in Europe since the time of the Romans and was described



by Columella and Catone. It has been ascribed to the untimely cultivation of a soil, moist in the upper strata and dry in the lower, after a recent limited rainfall. The plants growing therein bear very few seeds and assume a rigid and starved appearance some time after the cultivation. The present author after long periods of study has not succeeded in reproducing the condition experimentally.—A. Bonazzi.

1537. OGG, WILLIAM GAMMIE, AND JAMES HENDRICK. *Studies of a Scottish drift soil. Part II.* Jour. Agric. Sci. 10: 333-342. 1920.—Part II of this series deals with the absorptive power of the soil and its mechanical fractions. The soil studied is a glacial drift soil from granitic rocks and is in a comparatively undecomposed state. It contains no carbonate of lime and has a comparatively small clay fraction; about 9 per cent of organic matter is present. This soil, known as "Craibstone" soil, has a considerable absorptive power for ammonia from a solution of sulphate of ammonia. The absorptive power per unit weight of the fractions increases with the decrease in size of the particles, reaching a maximum in clay. Fine silt and ordinary silt have a high absorptive power, probably partly due to organic matter. It appears probable that both the amount of surface exposed and the chemical nature of the soil are important in determining its absorptive power. The small amount of clay present indicates that much of the absorptive power is due to silt. [See following abstract.]—V. H. Young.

1538. OGG, WILLIAM GAMMIE, AND JAMES HENDRICK. *Studies of a Scottish drift soil. Part III.* Jour. Agric. Sci. 10: 343-357. 3 fig. 1920.—This section deals with the absorptive power of powdered granite and a comparison with "Craibstone" soil. It was shown that powdered granite has a considerable adsorptive power which compares favorably with that of "Craibstone" soil [see preceding entry]. Adsorption does not increase proportionately with the increase in area of finer fractions; it increases at a lower rate. The effect of ignition is to reduce the absorptive power and this effect is more marked with soil fractions. Absorbed ammonia is only gradually washed out by water and cannot be completely removed in this way. Adsorption by powdered granite and little-weathered soils appears to be principally a phenomenon of adsorption. [See preceding abstract.]—V. H. Young.

## TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 769, 953, 957, 1085, 1212, 1446)

### GENERAL

1539. BARNHART, JOHN HENDLEY. *The so-called generic names of Ehrhart's Phyto-phylacium.* Rhodora 22: 180-182. 1920.—A criticism of the use of Ehrhart's so-called generic names, as such, by certain American authors. The present author shows by quotations from Ehrhart, and from OEDER who first originated the idea of such names, that these were first proposed as "nomina usualia" for non-botanical conversational use and "had no connection or relation to classification, to genus, or to specific relationship."—James P. Poole.

1540. BURKILL, I. H. *Notes on Cola trees in the Economic Garden, Singapore.* Gardens' Bull. Straits Settlements 2: 74-86. 1 fig. 1918.—The author gives a history of the Cola trees in the above Garden, where they were introduced in 1879, their growth and production. He adopts the nomenclature of CHEVALIER and PERROT as expounded by them in "Vegetaux utiles de l'Afrique tropicale française," VI, 1911. They claim that the *Sterculia acuminata* Beauv. of Benin is a small bushy tree 7 or 8 feet in height and does not produce the Kola Nut of Sierre Leone, which is the Kola of commerce, or but a very small part of it; that the tree which produces the larger part of the Kola Nut of Sierre Leone is 40 feet in height and is

*Sterculia nitida* Vent. The former produces Kola Nuts with 3 or more cotyledons and the latter those with only 2 cotyledons. Under the genus *Cola* these species are known respectively as *C. acuminata* (Beauv.) Schott & Endl. and *C. nitida* (Vent.) Schott & Endl. Three known varieties of the latter are given, namely, var. *alba*, var. *rubra*, and var. *mixta*. The fruit and seeds are illustrated and fully described. The active principles and chemical composition are given and also elaborate notes on the trade, cost of drugs and chemicals during the war, cultivation, yields, and properties.—*Oliver A. Farwell.*

1541. KOPS, JAN, F. W., VAN EEDEN, EN L. VUYCK. *Flora Batava. Afbeelding en Beschrijving der Nederlandsche Gewassen.* [Flora of Batavia. Illustrations and descriptions of the plants of Holland.] 402e–405e Aflevering. *Pl. 2001–2016.* Martinus Nijhoff: 's-Gravenhage, 1920.—The vascular plants illustrated and described in the present parts are: *Agrostis scabra* Willd., *Dipsacus laciniatus* L., *Lepidium bonariense* L., *Phalaris praemorsa* Lam. & DC., *Rubus procerus* P. J. Müll., *R. rubicundus* P. J. Müll. & Wirtg., *R. Wahlenbergii* Arrh., and *Rumex fennicus* Murbeck. The non-vascular plants included are: *Boletus felleus* Bull., *Cyphella capula* Holmsk., *Hygrophorus agathosmus* Fr., *Pleurotus mitis* P., *Polyporus leucomelos* P., *Russula fellea* Fr., *Sistotrema confluens* Fr., *Tricholoma Russula* Schaeff., and *Xylaris Guepini* (Fr.) Ces. [See Bot. Absts. 1, Entry 635; 5, Entry 2347; 7, Entry 1457; 8, Entry 1298.] —*J. M. Greenman.*

1542. [NORSTEDT, C. T. O.] [Swedish rev. of: BEAUVERD, G. *Monographie du genre Melampyrum.* (Monograph of the genus *Melampyrum.*) Mem. Soc. Phys. et Hist. Nat. Genève 38: 291–637. 31 fig. 1916–1917.] Bot. Notiser 1918: 159. 1918.

1543. [NORSTEDT, C. T. O.] [Swedish rev. of: LINDMAN, C. A. M. *Svensk Fanerogamflora.* (Swedish Phanerogam-flora.) 8 vo., viii + 639 p., 330 fig. 1918.] Bot. Notiser 1918: 306–308. 1918.

1544. OSTERHOUT, GEO. E. *Rocky Mountain botany and the Long expedition of 1820.* Bull. Torrey Bot. Club 47: 555–562. 1920.—An account is given of the work of Dr. E. P. JAMES of the Long Expedition with the itinerary of the expedition and a list of the new species collected.—*P. A. Munz.*

1545. VUYCK, L., EN H. C. VAN DE PAVORD SMITS. *Naamlijst der Nederlandsche Gewassen afgebeeld en beschreven in deel I–XXV der Flora Batava.* [Index of the plants of Holland illustrated and described in parts I–XXV of the Flora of Batavia.] 12 × 19 cm., 131 p. Martinus Nijhoff: 's-Gravenhage, 1920.—This index is an alphabetical list of the scientific and common names of the plants included in the first 25 parts of the "Flora Batava."—*J. M. Greenman.*

#### PTERIDOPHYTES

1546. MOXLEY, G. L. *Notes, chiefly nomenclatorial, on southern California ferns.* Bull. Southern California Acad. Sci. 19: 56–57. 1920.—Two new combinations of ferns, *Thelypteris normalis* (C. Chr.) Moxley and *Thelypteris arguta* (Kaulf.) Moxley, are given.—*Roxana Stinchfield Ferris.*

#### SPERMATOPHYTES

1547. ANONYMOUS. *Poa omeiensis.* Jour. Botany 58: 295. 1920.—*Poa omeiensis* Rendle (Jour. Botany 58: 25, 1920) is an abortive name, hence should be replaced by *P. szechuensis* Rendle.—*K. M. Wiegand.*

1548. ANONYMOUS. *The name Alsine.* [Rev. of: SPRAGUE, T. A. *Stellularia* or *Alsine.* Bull. Misc. Inf. Kew 1920: 308–318. 1920.] Jour. Botany 58: 294. 1920.

1549. ASHE, W. W. *Notes on trees and shrubs of eastern North America.* Bull. Torrey Bot. Club 47: 581–582. 1920.—*Prunus allegheniensis* Porter is shown to extend as far south

in distribution as Virginia and West Virginia; a shrubby form of *Azalea arborescens* Pursh is discussed, which grows at Great Falls, Virginia; and *Azalea neglecta* sp. nov. is described.

—P. A. Munz.

1550. BREWSTER, A. A. **Flowers of Haemodorum, blood root.** Australian Nat. 4: 152. 1920.—A semi-popular note on the form and number of the floral parts. The flower opens to a very limited extent, but pollination by "honey lovers" is inferred from the nectaries. Size and color are referred to only as "this seemingly insignificant 'black' flower." If black, it is striking.—T. C. Frye.

1551. DAVIDSON, A. **New or noteworthy additions to the flora of southern California.** Bull. Southern California Acad. Sci. 19: 54–56. 1920.—With distributional notes of various flowering plants there is a description of a new species, *Allium montigenum* Davidson.—Roxana Stinchfield Ferris.

1552. FERNALD, M. L. **Rubus recurvicaulis Blanchard, var. armatus n. var.** Rhodora 22: 168. 1920.—This new variety strongly simulates *R. tardatus* Blanchard, in its bristly inflorescence, but has the leaflets broader and rounded at the base as in typical *R. recurvicaulis* which occurs with the variety, and to which it intergrades. Specimens have been collected in Newfoundland, Miquelon, and Cape Breton.—James P. Poole.

1553. FERNALD, M. L., AND K. M. WIEGAND. **Studies of some boreal American Cerastiums of the section Orthodon.** Rhodora 22: 169–179. 1920.—Pursuant to their studies of Newfoundland and Labrador collections of *Cerastium*, the authors here publish the result of their investigations of the American species of the section *Orthodon*, the plants of which have passed in America under the composite species *C. alpinum* L., *C. vulgatum* L., and *C. arvense* L. They recognize the following species, varieties, and forms: *C. alpinum* L., *C. alpinum* var. *legitimum* Lindblom, *C. alpinum* forma *pulvinata* Simmons, *C. alpinum* var. *glanduliferum* Koch., *C. alpinum* var. *glutinoso-lanatum* Facchini., *C. alpinum* var. *lanatum* (Lam.) Hegetschw., *C. Beeringianum* Cham. & Schlecht., *C. Beeringianum* var. *capillare* n. var., *C. Fischerianum* Seringe, *C. arcticum* Lange, *C. Earlei* Rydberg, *C. terrae-novae* n. sp., *C. terrae-novae* forma *Waghornei* n. f., *C. unalaschkense* Takeda, *C. vulgatum* L., *C. vulgatum* var. *hirsutum* Fries., and *C. arvense* L. Bibliography and synonymy are given except for the last species. In this case the authors state that all their attempts to reduce the species-complex to definite species or varieties with natural ranges have proved futile.—James P. Poole.

1554. GODFERTY, M. J. **The problem of the British marsh orchids.** Jour. Botany 58: 286–290. 1920.—*Orchis latifolia* was studied at Vence, Alpes Maritimes, France, last May where *O. maculata* was entirely absent. Instead of a large proportion of plants with unspotted leaves and a wide variation in the markings of the lip very little of either peculiarity was found. The spots were almost always present, and were either ringed or solid. The author is convinced that *O. latifolia* of this region is identical with the spotted-leaved marsh orchis of Great Britain. *O. latifolia* in Vence is certainly not a hybrid of some species with *O. maculata*, which is absent. The suggestion that *O. praetermissa* Druce is the true *O. latifolia* has no foundation. The spotted leaved British marsh orchis is probably simply *O. latifolia*, and not a hybrid. Confusion has arisen through the erroneous identification of hybrids as *O. latifolia*. With the recognition of *O. latifolia* as a species the problem of the British marsh orchis is much simplified. The question as to whether there are unspotted forms of *O. latifolia* distinct from *O. praetermissa* remains unsolved.—K. M. Wiegand.

1555. HEMSLEY, W. B. [Rev. of: MAIDEN, J. H. **A critical revision of the genus Eucalyptus.** Vol. 2, parts 8–10; Vol. 3, parts 1–8; Vol. 4, parts 1, 3, 5–10 (parts 18–28, 31, 33, 35–40 of the complete work). W. A. Gullick: Sydney, 1913–1920.] Nature 106: 45. 1920.—See Bot. Absts. 1, Entry 806; 2, Entry 1355; 3, Entries 1308, 2995; 7, Entry 1464.



1556. HERVEY, E. WILLIAMS. A rare variety of *Vitis labrusca*. *Rhodora* 22: 183-184. 1920.—Report of a white variety of *V. labrusca* found on sale in the New Bedford market and traced to a vine growing in the woods near the town of Rochester, Massachusetts. Report of the same variety in the woods in Westport. Editor's note refers this grape to the "White Fox," *V. labrusca* var. *alba*, found wild in the woods at York, Pennsylvania.—James P. Poole.
1557. JANSEN, P., EN W. H. WACHTER. Floristische aanteekeningen xvi. *Glyceria*, R. Br. [Floristical notes xvi. *Glyceria* R. Br.] *Nederland. Kruidk. Arch.* 1919: 317-325. 1919.—The occurrence and description of species, varieties, and hybrids of the genus *Glyceria* in the Netherlands are given.—J. C. Th. Uphof.
1558. JENNINGS, O. E. New or noteworthy plants from northwestern Ontario. *Jour. Washington [D. C.] Acad. Sci.* 10: 453-460. 1920.—From collections made by the author and Mrs. O. E. JENNINGS in Ontario to the north and northwest of Lake Superior the following new species and varieties are described: *Lysias orbiculata* (Pursh) Rydb. var. *pauciflora*, *Kneiffia depauperata*, *Pyrola uliginosa* Torr. var. *gracilis*, *P. compacta*, *P. chlorantha* Sw. var. *revoluta*, *Scutellaria lateriflora* L. var. *axillaris*, *Stachys palustris* L. var. *puberula*, *S. palustris* L. var. *macrocalyx*, *S. palustris* L. var. *nipigonensis*.—E. B. Payson.
1559. LEWTON, F. L. The history of kidney cotton. *Jour. Washington [D. C.] Acad. Sci.* 10: 591-597. 2 fig. 1920.—An account of its nomenclature. The name *Gossypium lapideum* Tussac, published in 1818, is accepted.—Helen M. Gilkey.
1560. MACCAUGHEY, VAUGHAN. The Mangrove. *Amer. Bot.* 25: 42. 1919.—*Rhizophora Mangle* L. is not native to the Hawaiian Islands but has been introduced near Honolulu where it has increased, suggesting that it would be a desirable species for planting on the coast. The species is also described and its uses given.—W. N. Clute.
1561. MACKENZIE, KENNETH K. Scientific names applicable to our purple-flowered Eupatoriums. *Rhodora* 22: 157-165. 1920.—In referring to K. M. WIEGAND's article "Eupatorium purpureum and its allies" (*Rhodora* 22: 57), the author is in accord with the latter's conclusions that there are 4 distinct and well-marked species in this group but is not in agreement with him when it comes to applying names occurring in botanical literature to the various species recognized. The present author gives the 4 species numbers in the same way as done by Wiegand and discusses at some length the problem of the identity of each.—James P. Poole.
1562. MOXLEY, GEORGE L. *Zauschneria orbiculata* n. sp. *Bull. Southern California Acad. Sci.* 19: 30. 1920.
1563. NAKAI, TAKENOSHIN. Notulae ad plantas Japoniae et Coreae XX. [Notes on the plants of Japan and Corea. XX.] *Bot. Mag. Tôkyô* 33: 41-61. 1919.—Besides brief miscellaneous notes the following new species and varieties are described and new combinations made: *Carex daisenensis*, *Salix meta-formosa*, *S. orthostemma*, *S. sericeo-cinerea*, *S. sericeo-cinerea* var. *lanata*, *Alnus borealis* Koidzumi var. *koreana* (*A. japonica* Siebold & Zucc. var. *koreana* Callier), *A. borealis* Koidzumi var. *latifolia* (*A. japonica* Siebold & Zucc. var. *latifolia* Callier), *A. borealis* Koidzumi var. *paniculata* (*A. paniculata* Nakai), *A. japonica* Siebold & Zucc. var. *rufa*, *A. vermicularis*, *Betula Schmidtii* Regel var. *lancea*, *Parietaria coreana*, *Polygonatum lyratum*, *Rheum coreanum*, *Melandrium umbellatum*, *Clematis subtriterinata*, *C. subtriterinata* var. *tennuiifolia*, *C. ochotensis* Poirer var. *ternata*, *Isopyrum insigne*, *Pulsatilla nivalis*, *Thalictrum osmorhizoides*, *T. spirostigma*, *C. Maximowicziana* (*C. speciosa* Maxim.), *Arabis ligulifolia*, *Barbarea sibirica* (*B. vulgaris* R. Br. var. *sibirica* Regel), *B. hondoensis*, *Cotyledon filifera*, *Astilbe chinensis* (Maxim.) Franch. & Savat. var. *formosa*, *A. chinensis* (Maxim.) Franch. & Savat. var. *paniculata*, *A. hachijoensis*, *Spiraea pseudo-crenata*, *Sorbus amurensis* Koehne var. *rufa*, *Potentilla chinensis* Seringe var. *littoralis*, *P. chinensis* Seringe

var. *pseudo-chinensis*, *Astragalus setsureianus*, *Phellodendron molle*, *Acer palmatum* Thunb.  
 var. *pilosum*, *A. pictum* Thunb. var. *horizontale*, *Tilia amurensis* Komarov var. *rufa*, *T. amurensis* Komarov var. *koreana*.—E. B. Payson.

1564. OMANG, S. O. F. *Hieracium*-Sippen der Gruppe Alpina aus dem südlichen Norwegen. III. [*Hieracium* forms of the group Alpina in southern Norway.] *Nyt Mag. Naturvidenskaberne* 56: 69-106. 1919.—Studies of *Hieracium* during July-August 1913 in mountain districts has resulted in the publication of the following new species: *H. applicans*, *H. callianthum*, *H. dissotocum*, *H. excretum*, *H. eucalpideum*, *H. euphyllotum*, *H. helinense*, *H. limatum*, *H. lomochnoum*, *H. monacroides*, *H. mutilescens*, *H. nannocephaloides*, *H. nannocephalum*, *H. odontolipes*, *H. paramecodes*, *H. paramorphum*, *H. sceletum*, *H. sordidiceps*, *H. tanycladum*, *H. tenellescens*, and *H. tenuiceps*.—A. Gundersen.

1565. PARKER, R. N. *Erythrina glabrescens* sp. nova. *Indian Forester* 46: 647-648. 1920.—A new tree reaching a height of 50-60 feet and a girth of 5-6 feet is described from India.—E. N. Munns.

1566. PFEIFFER, H. *Ficiniae speciebus novis aucta*. [New species of *Ficina*.] *Herbarium* 54: 33-34. 1920.—New species and varieties of *Ficina*, mostly from South Africa, are described as follows: *Ficina atrostachya*, *F. dasystachya* C. B. Clarke var. *Burchellii*, *F. Schlechteriana*, *F. thyrsoidea*, *F. canaliculata*, *F. decidua*, *F. Trinkleriana*.—H. A. Gleason.

1567. PIPER, C. V. A new genus of Leguminosae. *Jour. Washington [D. C.] Acad. Sci.* 10: 432-435. 1920.—*Monoplegma* is proposed as a new genus to which is referred one species, *M. sphaerospermum*, from Costa Rica. Superficially this plant resembles species of *Canavalia* but floral characters indicate that its relationship is much closer to *Dolichos*.—Helen M. Gilkey.

1568. PUGSLEY, H. W. Notes on the British hawkweeds. *Jour. Botany* 58: 281-285. 1920.—The notes were compiled in connection with an attempt to work out the British hawkweeds, *Hieracium*, of which during the past 25 years 250 gatherings have been made. A brief historical sketch of the study of this genus in Britain is given. Fourteen species are listed with accompanying notes on distribution, specific validity, and nomenclature. *Hieracium holophyllum* Linton *β. angustisquamum* is described as new.—K. M. Wiegand.

1569. RUSBY, H. H. Descriptions of three hundred new species of South American plants with an index to previously published South American species by the same author. 8 vo., 170 p. Published by the author: New York, December 20, 1920.—The following species of flowering plants, mostly from Colombia and Bolivia, are described as new to science: *Xanthosma bilineata*, *Tillandsia triangularis*, *T. attenuata*, *T. marantoidea*, *Dioscorea recurva*, *D. frutescens*, *D. truncata*, *D. Herbert-Smithii*, *D. hastatissima*, *Renealmia orinocensis*, *Myrica costata*, *Pouzolzia platyphylla*, *P. petiolata*, *Boehmeria sordida*, *Pilea macrophylla*, *Sahagunia colombiana*, *Myriocarpa magnifica*, *M. obscura*, *Roupala discolor*, *Struthanthus divaricatus*, *Aethanthus ovalis*, *Dendrophthora stricta*, *D. striata*, *Agonandra granatensis*, *Apodanthes tribracteata*, *Allionia craterimorpha*, *Berberis ovalifolia*, *B. densifolia*, *Cissampela tomentocarpa*, *Hyperbaena trinervis*, *Duguetia pauciflora*, *D. rostrata*, *Trigynaeia anastomosans*, *Oxandra ovata*, *Nectandra amplifolia*, *Ocotea flavescens*, *O. flexuosa*, *O. alloiophylla*, *Sparattanthelium Sprucei*, *Lepidium angustifolium*, *Radicula scabra*, *Morisonia elliptica*, *Elaeodendron macrophyllum*, *Brunellia boliviana*, *B. Brittonii*, *Weinmannia lyrata*, *Licania venosa*, *Parinarium pachyphyllum*, *Moquilea cuspidata*, *M. orinocensis*, *Rourea laxiflora*, *Tourneate costata*, *Lotoxalis phaseolifolia*, *L. manihotoides*, *Xanthoxalis unduavensis*, *X. flagellata*, *X. mollissima*, *X. biflexa*, *Ionoxalis pazensis*, *I. Buchtienii*, *Erythrozyllon densum*, *E. uniflorum*, *Picramnia villosa*, *Protium mucronatum*, *P. orinocense*, *Cedrela boliviana*, *Trichilia oblanceolata*, *Byrsonima Herbert-Smithii*, *Pterandra opulifolia*, *Heteropteris rhombifolia*, *Tetrapteris alloi-carpha*, *T. tenuistachys*, *Securidaca orinocensis*, *S. venosa*, *Monnina Buchtienii*, *Phyllanthus heteromorpha*, *Croton bondaensis*, *C. cienagensis*, *C. obtusus*, *C. ochromaefolius*, *Acalypha*



*salicioides*, *A. amplifolia*, *A. Williamsii*, *A. subscandens*, *A. jubifera*, *A. asterifolia*, *Pera benensis*, *Chaetocarpus Pearcei*, *Sebastiania boliviana*, *Euphorbia sanmartensis*, *E. chiogenoides*, *E. subtrifoliata*, *Ilex imbricata*, *Salacea sphaerocarpa*, *S. mucronata*, *S. catalinensis*, *Hippocratea foliosa*, *Rhamnus atroviridis*, *Gaya rubricaulis*, *Malvastrum micranthum*, *Ayenia acuminata*, *Sterculia laxiflora*, *Saurauja brevipes*, *S. Herbert-Smithii*, *Clusia oblanceolata*, *C. ternstroemioides*, *Vismia falcata*, *V. angustifolia*, *Calceolaria hirsuta*, *C. curvirostra*, *Rinorea dichotoma*, *Hasseltia lateriflora*, *Casearia onacaensis*, *C. chlorophoroidea*, *C. Herbert-Smithii*, *Begonia unduavensis*, *B. lignosa*, *B. oblanceolata*, *B. heterodonta*, *B. subcostata*, *Grislea compacta*, *Ammania pedunculata*, *Combretum latipaniculatum*, *C. multidiscum*, *C. oblongifolium*, *Maieta robusta*, *Hartmannia boliviana*, *Pentapanax granatensis*, *Hydrocotyle grossulariaefolia*, *Gaultheria sanmartensis*, *G. tetriches*, *G. Fendleri*, *Macleania robusta*, *M. arcuata*, *M. recurva*, *Sophoclesia robusta*, *Vacciniopsis tetramera*, *Psammisia elegans*, *Cybianthus foliosus*, *Icacorea granatensis*, *I. Herbert-Smithii*, *I. sanmartensis*, *Symplocos mapirensis*, *Buddleia cochabambensis*, *Spigelia filipes*, *Aspidosperma elliptica*, *Tabernaemontana longiflora*, *T. albescens*, *T. cuspidata*, *T. myriantha Britton*, *Rauwolfia littoralis*, *Echites Sanctae-Martae*, *E. Laurentiae-disca*, *E. bicorniculata*, *Dipladenia alba-viridis*, *D. Buchtienii*, *D. piladenia*, *D. tetradenia*, *D. glabra*, *Odontadenia cuspidata* (*Dipladenia cuspidata* Rusby), *Mandevilla attenuata*, *Forsteronia foliosa*, *Prestonia mucronata*, *P. robusta*, *P. gracilis*, *Hemipogon andinum*, *H. Williamsii*, *Irmischia angustifolia*, *I. aristata*, *Philibertella filipes*, *P. ovalifolia*, *Stenomeria tomentosa*, *Metastelma atrovirens*, *M. pallidum*, *M. ovatum*, *Tassadia recurva*, *Ditassa Mandoni*, *Schistogyne pentaseta*, *Amphistelma leptocarpa*, *Vincetoxicum acutissimum*, *Marsdenia ecorpuscula*, *M. inelegans*, *M. asclepiodea*, *Phaeostemma grandifolia*, *Gonolobus Squiresii*, *G. attenuatus*, *G. leucodermis*, *Maripa acuminata*, *M. repens*, *Ipomoea hilarifolia*, *Cordia carnosae*, *C. opaca*, *C. subtruncata*, *Bourreia viridis*, *Tournefortia macrostachya*, *Coldenia aggregata*, *C. elongata*, *Aegiphila stricta*, *Lippia subterranea*, *Salvia tenuistachya*, *S. viridifolia*, *S. libanensis*, *S. multispicata*, *S. secundiflora*, *Solanum tetrapetalum*, *S. penduliflorum*, *S. scorpiodeum*, *S. auctosepalum*, *S. sacupanense*, *S. deltoideum*, *Cyphomandra chlorantha*, *C. bassovioides*, *Bassovia calceolarioides*, *B. ferruginea*, *Physalis petiolaris*, *P. cuneata*, *P. margaranthoides*, *Cestrum imbricatum*, *C. papyraceum*, *Cuspidaria ovalis*, *Adenocalymna purpurascens*, *A. latifolia*, *A. symmetrica*, *Besleria debilis*, *B. tenuifolia*, *Gesneria onacaensis*, *Diastema Williamsii*, *Phinaea albiflora*, *Columnnea stricta*, *C. pallida*, *C. grandifolia*, *C. latifolia*, *C. sanmartensis*, *Beloperone sanmartensis*, *Jacobinea Lindaviana*, *Rondeletia colombiana*, *R. ovata*, *Elaeagia obovata*, *E. mollis*, *Lygistum tomentosum*, *Gonzalagunia acutifolia*, *Posoqueria platysiphonia*, *Randia orinocensis*, *Duroia Sprucei*, *Alibertia granulosa*, *Hoffmannia striata*, *H. viridis*, *Guettarda discolor*, *G. rovpalaeifolia*, *Mapourea biacuminata*, *M. latifolia*, *Psychotria scabrifolia*, *P. albocostata*, *P. olyphylla*, *P. sanmartensis*, *P. indulgens*, *P. salicifolia*, *Palicourea populifolia*, *P. abbreviata*, *P. caloneura*, *P. Williamsii*, *Rudaea longirostris*, *Coussarea grandifolia*, *Borreria Herbert-Smithii*, *Siphocampylus rectiflorus*, *S. declinatus*, *Centropogon foliosum*, *Piptocarpha gracilis*, *Addisonia boliviana*, *Kanimia colombiana*, *Baccharis condensata*, *B. densifolia*, *Gnaphalium multicapitatum*, *Clibadium latifolium*, *C. lanceolatum*, *Baltimora ovata*, *Montanoa serrata*, *Wedelia heterophylla*, *W. symmetrica*, *Melanthera longipes*, *Encelia soratensis*, *E. deltoidea*, *Calea congesta*, *C. Herbert-Smithii*, *C. Holtoni*, *Pectis rosea*, *P. densa*, *Liabum biattenuatum*, *L. subumbellatum*, *L. stipulatum*, *L. falcatum*, *L. acuminatum*, *Moquinia macrocephala*, *Lycoseris oblongifolia*, *Onoseris alata*, and *Jungia grossulariaefolia*.—J. M. Greenman.

1570. SMALL, JOHN K. *Urechites pinetorum*. *Addisonia* 4: 21-22. Pl. 131 (colored). 1919.—The author gives a full description of this proposed new species of the family Apocynaceae, an inhabitant of the pine woods of the Everglade Keys of Florida, and includes notes on the related and long known species, *U. lutea* (L.) Britt., a vine, sometimes climbing to the top of tall trees, an inhabitant of the hammocks. The stem of the proposed species is erect.—T. J. Fitzpatrick.

1571. SMITH, CHARLES PIPER. *Studies in the genus Lupinus*—V. *The Sparsiflori*. *Bull. Torrey Bot. Club* 47: 487-509. Fig. 53-56. 1920.—Keys to, and diagnoses of, the following species and varieties of *Lupinus* are given: *L. hirsutissimus* Benth., *L. sparsiflorus* Benth.



and its varieties *arizonicus* (Wats.) comb. nov., *setosissimus* var. nov., *barbatulus* Thorneb. var. nov., *insignitus* var. nov., *inopinatus* var. nov., *Pondii* (Greene) comb. nov.; *L. truncatus* Nutt. and its variety *Burlewii* var. nov.; *L. Benthami* Heller and its variety *opimus* var. nov.; *L. citrinus* Kellogg; and *L. deflexus* Congdon.—P. A. Munz.

1572. STANDLEY, PAUL C. The North American species of *Agonandra*. Jour. Washington [D. C.] Acad. Sci. 10: 505–508. 1920.—Two new species, *A. obtusifolia* and *A. Conzattii*, are described and *A. racemosa* (*Schaefferia racemosa* DC.) appears as a new combination, all from Mexico. This is the first time that the genus has been reported from North America, and this is the only genus of the family Opiliaceae known on the western continent.—Helen M. Gilkey.

## MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

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1573. ANONYMOUS. Artificial wool from cotton waste. Sci. Amer. 123: 569. 1920.

1574. DOFLEIN, FRANZ. Das Problem des Todes und der Unsterblichkeit bei den Pflanzen und Tieren. [Death and immortality in plants and animals.] 119 p. G. Fischer: Jena, 1919.

1575. FONTANEL, P. Séchage des plantes pour herbiers. [The drying of plants for herbaria.] Nat. Canadien 47: 51–61. 1920.—The author notes the common and the complicated processes of drying plants and proposes an intermediate process depending first on drying under the usual pressure of absorbent layers but at a higher temperature, to accelerate the evaporation of moisture and forestall the degenerative action of enzymes and bacteria. This requires a current of heated air, the temperature being first between 60 and 70°C. Later the temperature should be considerably lowered. A box holds the plants over a suitable source of heat. Between the specimen sheets are sheets of tubed cardboard through which the upward current of warm air passes. Methods for treating certain plants with chemicals, to preserve color, elasticity, etc., and to prevent decomposition, are also considered.—A. H. MacKay.

1576. JORDAN, W. H. Director's report for 1919. New York Agric. Exp. Sta. [Geneva] Bull. 470. 28 p. 1919.—A discussion of administrative matters and of the research work of the station in 1919. A list of the publications issued by the station during 1918 and 1919 is appended.—F. C. Stewart.

1577. MOUNT, H. A. Our coal in the making. Sci. Amer. 123: 522, 532, 534–535. 4 fig. 1920.—A popular article on peat.—Chas. H. Otis.

1578. NEWTON, R. The quality of silage produced in barrels. Jour. Amer. Soc. Agron. 13: 1–11. 1921.—Judging by the odor, appearance, palatability, and chemical tests, barrels were found to be suitable experimental containers for silage. Silage from barrels was found to compare favorably with silage from farm silos.—F. M. Schertz.

1579. PATHAK, G. P. Some famine foods in Ahmedabad. Agric. Jour. India 15: 40–45. 1920.—New materials which have been utilized as famine food are Bid (rhizomes of *Scirpus kysoor*), Thek (rhizomes of *Cyperus bulbosus*), Poli of pan (the inflorescence of *Typha angustata*), and tubers and fruits of poyana (*Nymphaea stillata*). Bid contains about 70 per cent of digestible carbohydrates and 8–10 per cent of proteids. When used for human food the clods dug from the soil containing the rhizomes are left unbroken until thoroughly dried. The thek plant grows naturally in salt land; when properly dried and roasted it is used for flour. Poyana is the common water lily of the nal. The tubers are roasted in ashes or are

boiled. The seeds are used for flour. The dried tubers contain about 68 per cent of digestible carbohydrates and 15 per cent of proteids; the seed, 70 per cent of carbohydrates and 11 per cent of proteids.—*J. J. Skinner.*

1580. SCHNEGG, H. *Die Pilze und ihre volkwirtschaftliche Bedeutung.* [Fungi and their domestic significance.] *Ber. Senckenberg. Naturf. Ges. Frankfurt a. M.* 49: 90-91. 1919.—A synopsis of a lecture on the utilization of mushrooms is here given. Their importance as food for man and domestic animals is emphasized, and their employment in powdered form is especially recommended. It is further suggested that woody shelf-fungi be used as a substitute for cork and kindling wood.—*A. W. Evans.*

1581. SCHÜRHOFF, H. *Die Verwertung der Brennesseln als Gespinnstfasern.* [The utilization of nettle-fibers in spinning.] *Ber. Senckenberg. Naturf. Ges. Frankfurt a. M.* 49: 73. 1919.—In this report of a lecture on nettle-fibers, the utilization on a commercial basis is described, and the hope is expressed that these fibers may partially take the place of cotton in Germany.—*A. W. Evans.*

1582. VON STIETZ, G. E. C. *Molasses as fuel, and the manufacture of potash from the ashes.* *Louisiana Planter and Sugar Manufacturer* 64: 348-350. 1920.—Molasses can be burned in combination with other fuels. The ashes have a very high content of potassium salts. Methods of extracting and refining the ashes are given.—*C. W. Edgerton.*



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